The RUBBER AGE

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Published Twice-a-Month by

The PALMERTON PUBLISHING CO., Inc.

(Publication Office—1-3 Peace Street, New Brunswick, N. J.)

Editorial Office: 250 West 57th Street, New York City

Entered as Second Class Matter, August 24, 1927, at the Post Office at New Brunswick, N. J., under Act of March 3, 1879.

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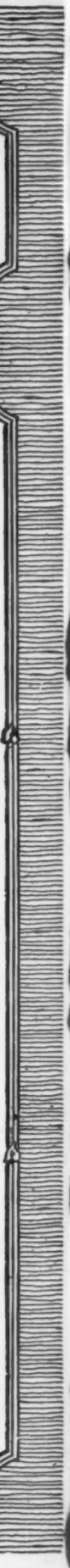

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LATE NEWS of the Industry

Five-Day Working Week Is Adopted By U. S. Rubber, Goodrich and Firestone

FOLLOWING the recommendation of the Rubber Manufacturers Association to retain present forces even if a reduction in hours is necessary and coinciding with the wage rate cuts in the steel industry, the United States Rubber Company announced on September 21 its adoption of the five-day week as the normal working schedule of its organization. The B. F. Goodrich Company on September 22 announced a 10 per cent reduction in working hours for salaried employes, and the Firestone Tire & Rubber Company on September 29 decided on a five-day week for all its salaried workers.

"The adoption of the five-day week as the normal working schedule of its entire organization in this country has been announced by the United States Rubber Company," said the statement issued by that company. "In announcing the change, F. B. Davis, Jr., president, pointed out that over the years there has been a gradual shortening of the working week and that the executive committee of the board of directors has decided to recognize the changed conditions of today by placing all operations on a five-day week basis.

"So far as is known the United States Rubber Company is the first of the great corporations to make the five-day week its normal working schedule.

"The change will affect the salaried employes on October 1. A reduction of one-eleventh in salaries will be made to conform with the reduction of one-eleventh in working time. The adjustment will apply to every salaried employe, including the president and other officers."

J. D. Tew, president of the B. F. Goodrich Company, announced that working hours of salaried employes were to be reduced 10 per cent, effective October 1, and salaries adjusted accordingly. The action was taken, the statement said, to prevent undesirable reductions in salaried forces.

The Firestone order called for 10 per cent salary cuts and a reduction from the five and a half day week to a five-day week for all salaried employes. Factory workers will continue on the six-hour day and four-day week schedule. Harvey S. Firestone, president of the company, on arriving home from Europe last month, declared his opinion that a five-hour day and five-day week would be a temporary expedient to meet the present depression. He pointed out that the Firestone plant at Akron had long been running on a 30-hour week and said that manufacturers should keep their plants running as a public duty even though operations are profitless.

The Goodyear Tire & Rubber Company early in September announced that all salaried employes would be required to take a two-week enforced vacation without pay between October 1 and February 1 as a means of keeping present working forces intact.

Scanning the Headlines

Five-day week is adopted by United States, Goodrich, Firestone . . . . Crude rubber drops to 4.40 cents on New York Exchange, but London price rises due to deflation of sterling . . . . FAULTLESS earnings hold up well in 1931 fiscal year . . . . Rubber goods exports continue to fall, but Hong Kong appears as new leading customer for scrap rubber in August . . . . FIRESTONE to establish battery plant at Los Angeles . . . . Tire dealers count stocks for October 1 government survey . . . . GOODRICH promotes tire and mechanical goods executives . . . . International Balloon Race is called off for this year, the depression apparently affecting backers of foreign bags . . . . PIONEER reopens Attica plant . . . . New York Rubber Group opens season with good attendance at first session . . . . SEIBERLING earnings continue high in August . . . . E. G. Holt sees new uses for rubber as chief hope of the industry . . . . Further declines in cotton prices and security quotations.

Department of Commerce Now Analyzing Semi-Annual Tire Dealers' Stock Survey

THE Department of Commerce, through the Rubber Division of the Bureau of Foreign and Domestic Commerce, has sent out to nearly 100,000 tire dealers throughout the country questionnaire forms for its semi-annual survey of stocks of tires and tubes. Returns showing the condition of inventories among dealers on October 1 are now being received by the department and are being tabulated so that a complete report may be issued by the end of the month.

The department is making a special effort to secure more complete coverage of stocks of tires held in company-owned stores than was secured last April 1. In view of the importance of mass distributors' stocks, the department believes that any preliminary report in connection with the current survey would be unjustified and possibly misleading. In addition, the issuance of a preliminary report might make it very difficult to include later returns from important mass distributors without revealing the position of individual firms. Consequently, only a single final report will be issued.

The current survey also includes two new questions with reference to vulcanizing equipment in the possesion of tire dealers. Those receiving the questionnaire are asked whether they have equipment for vulcanizing (a) passenger car tires and (b) truck tires.

Manufacturers are urged to encourage their dealers in every way possible to answer these questionnaires. By ascertaining the size of the available tire stocks through the country, the report drawn from this survey will serve as a guide for manufacturers in planning their production schedules for the next six months and will also develop a great amount of useful information for the dealers.

Trade circles look for a further drop in dealers' inventories. As of October 1, 1930, the survey showed that 31,522 dealers had 1,965,728 casings, an average of 62.4 per dealer, comparing with the averages in 1929 of 68.4 and in 1928 of 64.8. While the stock figures of October 1 are not strictly comparable to those compiled as of April 1, the survey taken on that date this year showed that 28,707 dealers had 2,249,927 casings or an average of 78.4 per dealer.

Rubber Service Laboratories Company Sues Scott, North and Kavalco Products

THE Monsanto Chemical Works, St. Louis, Mo., and its subsidiary, the Rubber Service Laboratories Company, Nitro, W. Va., and Akron, O., filed a bill of complaint in the United States District Court at Charleston, W. Va., on September 26 against Kavalco Products, Inc., and C. Olin North and Winfield Scott, formerly employed by the Monsanto subsidiary. The suit is for an injunction and accounting and charges that Messrs. North and Scott organized Kavalco Products while occupying positions of trust with Rubber Service and alleges use of confidential manufacturing and sales information belonging to the plaintiffs. A statement by Monsanto and Rubber Service follows, in part:

"Kavalco Products is a West Virginia corporation, incorporated September 20, 1929, and operates a manufacturing plant at Nitro, W. Va., adjacent to the plant of the Rubber Service Laboratories Company. C. Olin North was an officer, director and development manager of the Rubber Service Laboratories Company from the inception of that company until October 30, 1929, when he resigned. He was also one of the large stockholders of that company. Winfield Scott was chief chemist and a stockholder of the Rubber Service Laboratories Company from a date early in the organization until he resigned September 26, 1929.

"The Monsanto Chemical Works acquired all of the outstanding capital of the Rubber Service Laboratories Company in July, 1929. At that time the Rubber Service Laboratories Company was engaged in manufacturing among other products phenolphthalein, triphenyl phosphate, and was the only American producer of this latter product and had also conducted exclusive research on tricresyl phosphate and other products. The manufacturing processes used by Rubber Service Laboratories were secret and confidential and were the result of several years' research and experimentation, all of which work was done directly under the charge of North and Scott as development manager and chief research chemist, respectively. Neither of these two men had any experience in the manufacturing of these products prior to their connection with the Rubber Service Laboratories Company.

"North was engaged by the Rubber Service Laboratories Company for a year commencing June, 1929, but during the latter part of October, 1929, he requested his release, stating that he intended to enter the Chemical Warfare Service, which release was granted. During the month of September, 1929, North was acting head of the Rubber Service Laboratories Company during the absence of the president on a vacation and on the 26th of that month he accepted the resignation of Scott as chief research chemist.

"The Monsanto Chemical Works and the Rubber Service Laboratories Company charge in the suit that North and Scott organized Kavalco Products, which was incorporated September 20, 1929, while they still occupied positions of trust and confidence with the Rubber Service Laboratories Company and that North secured his release from his contract under misrepresentation and without intimating that he was then engaged in the formation of a competitive enterprise. Plaintiffs further charge that North enticed a number of his experienced and valued chemists and employes of the Rubber Service Laboratories to enter the employ of Kavalco Products. Plaintiffs further charge that Kavalco Products commenced the manufacture of phenolphthalein, triphenyl phosphate and tricresyl phosphate shortly after incorporation, without the lapse of a sufficient period for the development of processes, etc. Also plaintiffs charge that Kavalco Products is making use of confidential information of the Rubber Service Laboratories Company respecting the manufacture of these products and that it is also making use of confidential sales information acquired by North respecting purchases and customers of Rubber Service Laboratories Company from their particular specifications and selling processes. Plaintiffs charge that all such confidential sales information was received by North by reason of his being an officer and occupying a position of trust with the Rubber Service Laboratories Company and that he is now making use of such information and soliciting and selling customers of the Rubber Service Laboratories Company."

Exports of Automotive Rubber Goods Dropped to $1,649,255 During August

SHIPMENTS of automobile tires, inner tubes, tire sundries and repair materials from the United States during the month of August had a total value of $1,649,255, marking a sharp decline from the July figure of $1,892,281. British India was the chief market for passenger car casings, truck and bus casings and inner tubes, this being the first time in years that one country has stood in first place as a customer for all three classes. In the month 133,340 passenger car casings were exported with a value of $1,000,414 and 28,762 truck and bus casings, worth $507,695.

Rubber boots exported during the month totaled 104,412 pairs with a value of $239,757 and rubber shoe ship-

ments numbered 79,413 pairs with a value of $64,607, both figures representing increases over the July totals. Exports of canvas rubber-soled shoes, however, dropped slightly to 132,689 pairs, valued at $75,454. The United Kingdom was the leading market for rubber boots, while Argentina was the chief customer for canvas rubber-soled shoes. Denmark took the greatest number of rubber shoes, but the value of those shipped to Norway was higher.

Shipments of rubber belting in August amounted to 267,890 pounds, worth $110,228, and exports of rubber hose totaled 362,506 pounds with a value of $107,064, both showing sharp declines from the July totals. Chile took the greatest quantity of belting, but the chief market in point of value was the Union of South Africa, which was also the chief customer for rubber hose.

During August, the United States exported 917,917 pounds of reclaimed rubber, valued at $40,338, or 4.39 cents a pound as against an average value of July exports of 4.37 cents a pound, and 5,841,788 pounds of scrap and old rubber, worth $111,130. Canada continued to be far ahead of all other markets for reclaim, with smaller amounts going to the United Kingdom, Argentina, the Union of South Africa, the Philippine Islands, Germany and Australia. Hong Kong appeared for the first time as the chief destination for rubber scrap, although the value of shipments to that port was not nearly so high as that of the smaller exports to France and Spain.

Parts-Accessory Manufacturers Show Further Drop in Business in August

SHIPMENTS of service parts and accessories to wholesalers during August showed improvement over July, according to reports received by the Motor and Equipment Association from member automotive manufacturers, including several in the rubber industry. The August index figure for service parts stood at 127 per cent of the January, 1925, base to compare with 124 per cent for July and accessories went up to 66 per cent of the base from 57 per cent for July.

Declines, however, in shipments of original equipment to vehicle manufacturers and of shipments of service equipment to wholesalers were sufficient to bring the grand index of all shipments below the July figure. The grand index of all shipments for August stood at 79 per cent of the January, 1925, base figure to compare with 85 per cent for July and 91 per cent for August, 1930.

Parts and accessory makers selling to car and truck manufacturers for original equipment made shipments equal to 70 per cent of the base figure compared with 79 per cent for July, 91 for June, and 87 per cent for August, 1930.

Faultless Rubber Company Net Profit Is $314,721 During 1931 Fiscal Year

CONTINUING its course against the current trend of business, the Faultless Rubber Company, Ashland, O., manufacturer of molded goods and drug sundries, has reported for the year ended June 30, 1931, a net income of $314,721 after all charges, but before federal income taxes, equal to $4.27 a share on 73,597 common shares. This compares with a profit on a similar basis of $368,273, or $4.46 a share on 72,847 shares, in the year ended June 30, 1930, and with $131,940 in the year ended June 30, 1929.

Due to its steady profit showing, Faultless Rubber Company stock has been one of the firmest issues among the common shares of rubber manufacturing companies during this year and 1930. Thus far in 1931 it has fluctuated only between a high of 37 and a low of 30, selling currently near the latter figure. Last year it varied between 37 and 32½, and even in the boom and deflation year of 1929 it sold from a high of 45 to a low of 30.

On November 15, 1929, the Faultless Rubber Company called in all of its outstanding preferred stock to the amount of $493,300, placing its common shares in the place of priority in the matter of dividends. Dividends on the common stock were at that time increased to a rate of $2.50 a year, as compared to the $2 basis which had prevailed since October, 1925. Additional common shares were also sold in the fall of 1929 on the basis of 16 for each 100 then held by stockholders, this financing bringing nearly $300,000 into the treasury of the company.

The company's current position is strong, current assets totaling $974,832 and current liabilities $40,264. Cash of $182,889, with United States government and Federal Land Bank bonds of $271,772, approximate 50 per cent of the net current assets. Faultless has no other indebtedness and net worth is represented by 73,597 no-par common shares. Balance sheet June 30 is as follows:

ASSETS	
Current assets	$ 974,832
Fixed assets less depreciation	1,331,465
Other assets	8,018
Total	$2,314,317
LIABILITIES	
Current Liabilities	40,264
Reserves	9,101
Capital stock	1,346,692
Surplus	918,258
Total	$2,314,317

International Balloon Race Called Off; Plan to Hold 1932 Contest in Europe

THE International Balloon Race for the Gordon Bennett Trophy, which has been held in this country since 1926, has been definitely canceled for this year, with indications that the next international contest will take place in Europe in 1932. While newspaper reports said the contest had been called off because of lack of financial backing, indicating that the difficulty lay in this country, Ward T. Van Orman, international balloonist of the Goodyear Tire & Rubber Company, said the trouble was in getting enough foreign pilots to come to the United States this year to make the contest truly international.

A Washington dispatch says that the contest committee of the National Aeronautic Association, headed by Orville Wright, had decided to call off the event this year, and to take steps to stage the race in Europe hereafter, feeling that there is more interest in ballooning in Europe than in the United States.

Van Orman revealed that early in September he cabled Sidney Viet, foreign representative of the national association, in Paris, advised him of the difficulties being encountered in getting enough foreign pilots to come to this country to make the race an international one, and asked Viet whether or not he approved of dropping this year's race and approaching European balloonists about staging the race there in 1932. Viet, Van Orman said, cabled his approval of the plan.

This suggestion was given to the National Aeronautic Association on September 10, Van Orman said, with the decision from the contest committee to abandon plans for

(Other news of the industry will be found on Pages 29-35)

this year's race. As it takes about two months to prepare for an international race and no place has been chosen for it, there is no chance of reviving the project this year, even if enough foreign pilots could be induced to come, Van Orman said.

The United States captured the Gordon Bennett trophy in 1926, when Van Orman won the race from Antwerp, Belgium. The trophy has been here since, with Van Orman and his aide, Alan McCracken winning it again last year in the race from Cleveland. Lieutenants T. G. W. Settle and Wilfred Bushnell, first in the national race, and Frank A. Trotter and Roland J. Blair, second in the national race this year, with Van Orman and McCracken, would have been eligible to compete in the 1931 international race.

New York Rubber Group Opens Season With Good Attendance at First Meeting

MEMBERS of the New York Group of the Rubber Division, American Chemical Society, inaugurated their 1931-32 season on the evening of October 7 with a well-attended meeting at the club rooms of the Building Trades Employers' Association, 2 Park Avenue, New York City. About 125 members and guests were present for the dinner and the session that followed. W. H. Whitcomb, chairman of the Group, presided.

The program was opened with a discussion of "Rubber in Automobile Construction" by W. J. McCourtney, of the Chrysler Corporation, Highland Park, Mich. Mr. McCourtney stated that the Chrysler organization uses more than 450 different rubber parts and 50 different rubber specifications. He mentioned the more important rubber parts in detail, particularly the system of rubber mountings that gives "floating power" to the new Plymouth line. He described the equipment employed at the Chrysler laboratory to carry on rubber engineering work, gave details and results of some of the tests conducted on rubber parts, and indicated a few of the problems with respect to rubber applications that confront the automotive engineer, especially rubber-to-metal adhesion.

A motion picture film describing the United States Rubber Company's plantations was presented with running comment by John W. Bicknell, president and managing director of the United States Rubber Plantations, Inc. Methods of cultivation of crude rubber on the Sumatra estates of the United States Rubber Plantations, Inc., the largest in the world, were shown in detail, together with scenes of estate factory practice and of the shipping of rubber and liquid latex. Mr. Bicknell also dwelt upon the sanitary improvements, hospitalization, roadbuilding and other developments carried out by the United States Rubber Company through its plantation subsidiary in what had previously been largely jungle territory.

Prior to the meeting of the Group, the members of the executive committee held a session at which plans for the next regular meeting were discussed. The next session will be held on December 16 at the same location, and tentative arrangements have been made for several papers on latex and dispersed rubber, fuller details of which will be announced in the near future. An entertainment committee was formed and a program of interest is scheduled. Peter P. Pinto was named chairman of the entertainment committee, the other members being D. F. Cranor, W. L. Sturtevant and J. M. Ball.

The election of officers of the Group for 1932 will also be held at that time. A nominating committee was appointed, consisting of E. B. Curtis, chairman; A. A. Somerville and W. B. Wiegand. The billiard room, lounge and other facilities of the Building Trades Employers' Association club rooms will, as usual, be open for the use of members of the Group before the meeting.

Old and New Models in Rubber Machinery

SOMEONE recently said, "Replacing industry's obsolete equipment with improved machinery and tools now available is the way to win this economic war and to rebuild prosperity." Certainly this is true of the rubber industry, where much old equipment is still in use—despite the availability of modern machinery which is more economical, more efficient and considerably safer than the old equipment. Machinery manufacturers are urged to send in old and new photographs of their equipment for possible use in this series.

The Editor, THE RUBBER AGE.

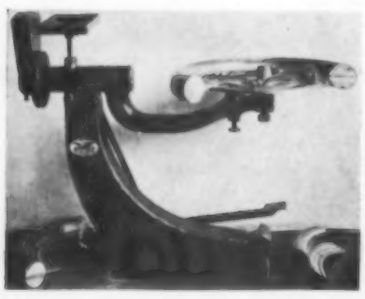


Fig. 1

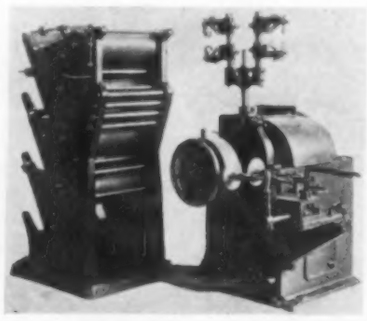


Fig. 2

Fig. 3

ONE of the first recollections of tire building methods dates back to the time when tire "buck" shown in Fig. 1 was used. All sizes of tires were built complete by hand on these pedestals. Washer type cores were used and the full core was left in the tire for the cure. Later the first tire machines came into use with its manual stitchers, stock holding racks and bead setting and searing tools. The drive was through a motor and clutch with both forward and reverse control with braking accomplished by throwing the foot pedal to the neutral position. The cores were still of the washer type as shown in Fig. 2. This machine has gradually evolved, however, to the modern type shown in Fig. 3, designed for the production of truck and bus tires with a range of sizes from 6" to 12.50". The unit is completely electrically controlled and the core for building is of the collapsible type. (Photos courtesy National Rubber Machinery Co., Akron, Ohio.)

RUBBER TANK LININGS
in Steel Pickling Operations

Advantages and Disadvantages of the Various Types of Linings Used—Vulcalock and Triflex Constructions — Extreme Temperature Changes Limit the Use of Hard Rubber

IN THE steel pickling industry, where sulphuric, muriatic, nitric or hydrofluoric acid may be used as the pickling or cleaning agent, the subject of containers or vats for these corrosives has always been one of great importance to the engineers or superintendents in charge of such operations. Practically every type of construction material has been used or experimented with at some time or other but over a period of years nothing has been found for pickling containers which could be considered entirely satisfactory.

Until recently rubber-lined pickling tanks or vats had been considered unsatisfactory for service of this nature due to the fact that

1. Soft rubber linings are subject to physical damage as a result of heavy falling objects or gouging action.
2. The temperatures usually involved are above the range considered satisfactory for prolonged service in soft rubber.
3. Extreme temperature changes limit the use of hard rubber.

Types of pickling vessels used at the present time include plain wood tanks of heavy construction; lead lined wood or steel tanks; masonry construction using acid-proof

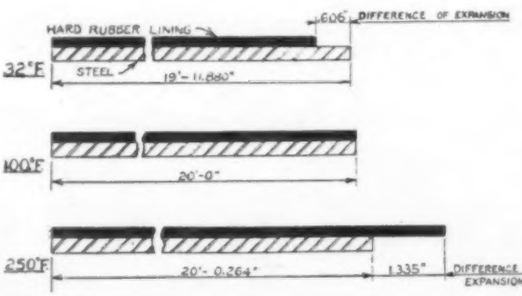


Fig. 1

Relative Expansion of Hard Rubber and Steel

brick or cement; bitumastic lining in wood or concrete, and rubber lined wood or steel tanks.

The disadvantages of wooden tanks lie in their relatively short life which in turn depends on the concentration and temperature of the acid used, and their cost in constant repairs and maintenance is high. In lead linings, the extreme temperature changes cause constant cracking at the seams, due to expansion and contraction. They are also difficult and expensive to repair. The life of bitumastic linings is usually short and difficulty is often encountered in preparing a tight lining. Masonry construction is difficult and tedious to install and particularly difficult to repair, if cracks should occur. In rubber-lined wood or steel tanks the linings have the inherent disadvantage of having a short life at elevated temperatures and if a long life is expected, temperatures in excess of 150 degrees F. should not be allowed. On the other hand, acid concentration in excess of 50 per cent sulphuric acid cannot be considered. Rubber linings when punctured can be easily repaired and the rubber being vulcanized intimately to the surface of the wood or steel, prevents the spreading of the acid behind the lining.

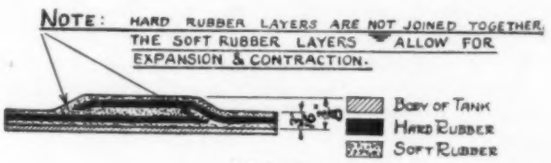

NOTE: HARD RUBBER LAYERS ARE NOT JOINED TOGETHER, THE SOFT RUBBER LAYERS ALLOW FOR EXPANSION & CONTRACTION.
BODY OF TANK
HARD RUBBER
SOFT RUBBER

Fig. 2

Triflex Expansion Joint

In an effort to broaden the range of usefulness of rubber linings in pickling vessels combinations of the best features of the above constructions were combined with rubber into units designed for long and useful lfe.

The Vulcalock Process

The principle underlying the Goodrich rubber-lined products is the Vulcalock process, embodying a new method of vulcanization, whereby soft elastic rubber can be attached directly to the surface of metals with an adhesion exceeding 500 pounds per square inch, making practically an integral union.

The Vulcalock process does not depend upon an adhesive but "locks" the rubber into the "pores" of the metal base, so that the union is as permanent as the rubber itself.

Rubber may vary in its density or hardness over a scale beginning with a soft resilient product, such as rubber bands, up to a bone-hard and brittle product, such as a rubber comb or battery container. During this progression of physical states, a number of very interesting and important changes take place. For example, the soft rubber band may have up to 600 per cent elongation, be very resilient, and have a tensile strength of 4,000 pounds per

Data and illustrations by courtesy of B. F. Goodrich Co., Akron, Ohio.

square inch and be very resistant to abrasion, whereas the hard rubber would have practically no elongation, be very fragile, have a tensile strength of 30,000 pounds per square inch, be utterly worthless as regards life in abrasive service and have a coefficient of expansion seven to nine times that of steel. Fig 1 shows what this expansion would amount to over a range of temperatures in the case of a very hard rubber compound. As the temperature is increased

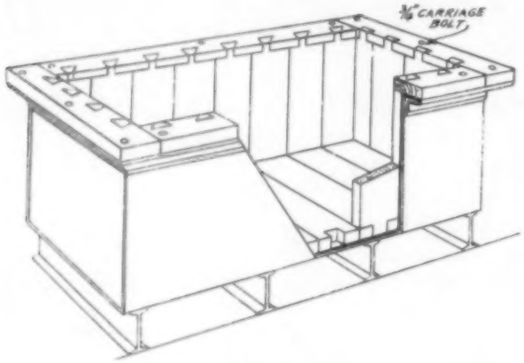


Fig. 3
Wood Sheathed Vulcalock Steel Tank

this hard rubber material tends to become more plastic but as the temperatures are lowered it becomes glass-like in its nature; hence, extreme changes of temperature taking place in a large vessel usually produce disastrous results in the nature of cracks developing in the rubber. Hard rubber is more resistant to acids at higher temperatures and is also more resistant to the gouging action of sharp objects than soft rubber; therefore, in some cases it has more desirable properties than soft rubber but on the other hand soft rubber, being resilient, accommodates itself to conditions of expansion and contraction without damage.

Hard rubber is very resistant to ordinary mineral or vegetable oils whereas soft rubber is unsatisfactory. In practically all pickling operations small quantities of oil are encountered at the surface of the pickling acid and there is an increasing tendency to make use of the newer organic inhibitors which have practically the same effect on rubber as oil; hence, it is necessary to use hard rubber in some form or other for this service.

Triflex Construction

In the Triflex construction, Fig. 2, use has been made of the advantages of both types of rubber, also turning what seem to be disadvantages of each into useful and practical applications by the combination. This is a combination of soft and hard rubber plies arranged so that the hard rubber plies are not united but overlap each other, thus offering the protection against physical damage of a hard rubber layer and arranged so that all lap seams form expansion joints. These joints absorb the expansion and contraction of hard rubber and eliminate buckling and cracking. The hard rubber layer also offers the advantage of a more resistant material so cushioned as to render it serviceable under conditions of vibration, impact and strain.

Fig. 3 represents a wood or steel rubber-lined pickling tank using Triflex construction with a 2" thick wood protective sheathing. The sole purpose of this sheathing is to prevent physical damage to the rubber and the construction is not recommended for service in excess of 150 degrees Fahrenheit. The timber on top of the flanges is held in place with bolts. Note that the sheathing is free from nails or metal parts except the bolts.

Rubber-lined steel pickling tanks with acid proof brick and cement linings are also in use, as shown in Fig. 4. The brick work can be laid in place by a brick mason as there are no irregularities to be encountered. The brick lining affords excellent protection against physical damage to the rubber lining. Temperatures in excess of 212 degrees Fahrenheit can be handled provided a proportionate additional thickness of brick is used.

This type of construction is exceptionally heavy and must be adequately supported to prevent sagging of tank bottom. It is recommended that the tank be placed on metal, wood or acid brick supports as represented in the illustration. This construction elevates the tank so that air may be freely circulate over the sides and bottom of the tank and thus dissipates the heat as fast as it radiates to the atmosphere. This type of tank should never be lagged

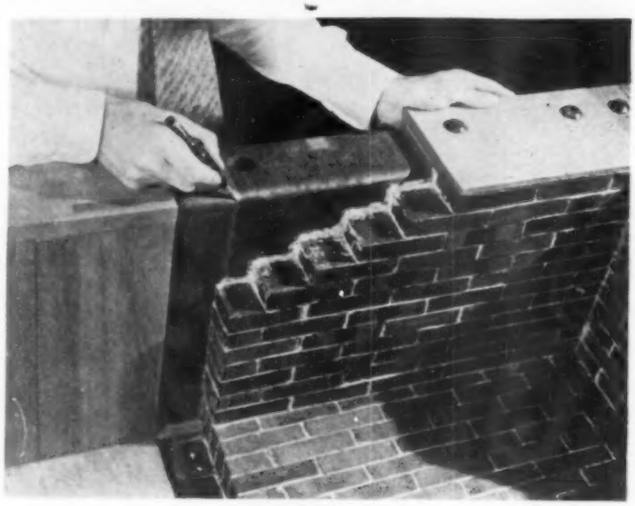


Fig. 4
Showing Wood or Brick Lined Pickling Tank with Sub-Lining of Rubber

in any manner or placed directly on a solid foundation.

The Triflex construction can be applied in the field at the customer's plant and vulcanized in place by the use of boiling water or it can be applied at the rubber factory. Rubber lining can be offered for any temperature condition only when protective sheathing of wood or brick is used to prevent damage to the lining.

Comparative Costs

In general a high grade wood pickling container is slightly higher in initial expense than a rubber-lined steel container. Where temperatures are below 160 degrees Fahrenheit and a wood protective sheathing is used the costs of the two types erected and ready for service are practically the same. In the case of rubber-lined steel with brick sheathing the cost will be slightly higher than wood construction but a comparatively longer life can be expected.

Rubber Tread Footpath

A UNIQUE rubber paving development has recently been attempted with success in Clydebank, England, in the form of a rubber tread, non-skid footpath up a steep section of the town known as Kilbowie Hill. Many accidents to pedestrians have occurred in this section, owing to the slippery nature of the old concrete pavement, especially in the winter months.

The footpath extends 180 yards and laid on an incline of 1 in 10. A foundation of broken cement, bricks, ashes and sand form a bed for the treads, which are made of reinforced rubber, 2 inches thick and cut into various sizes.

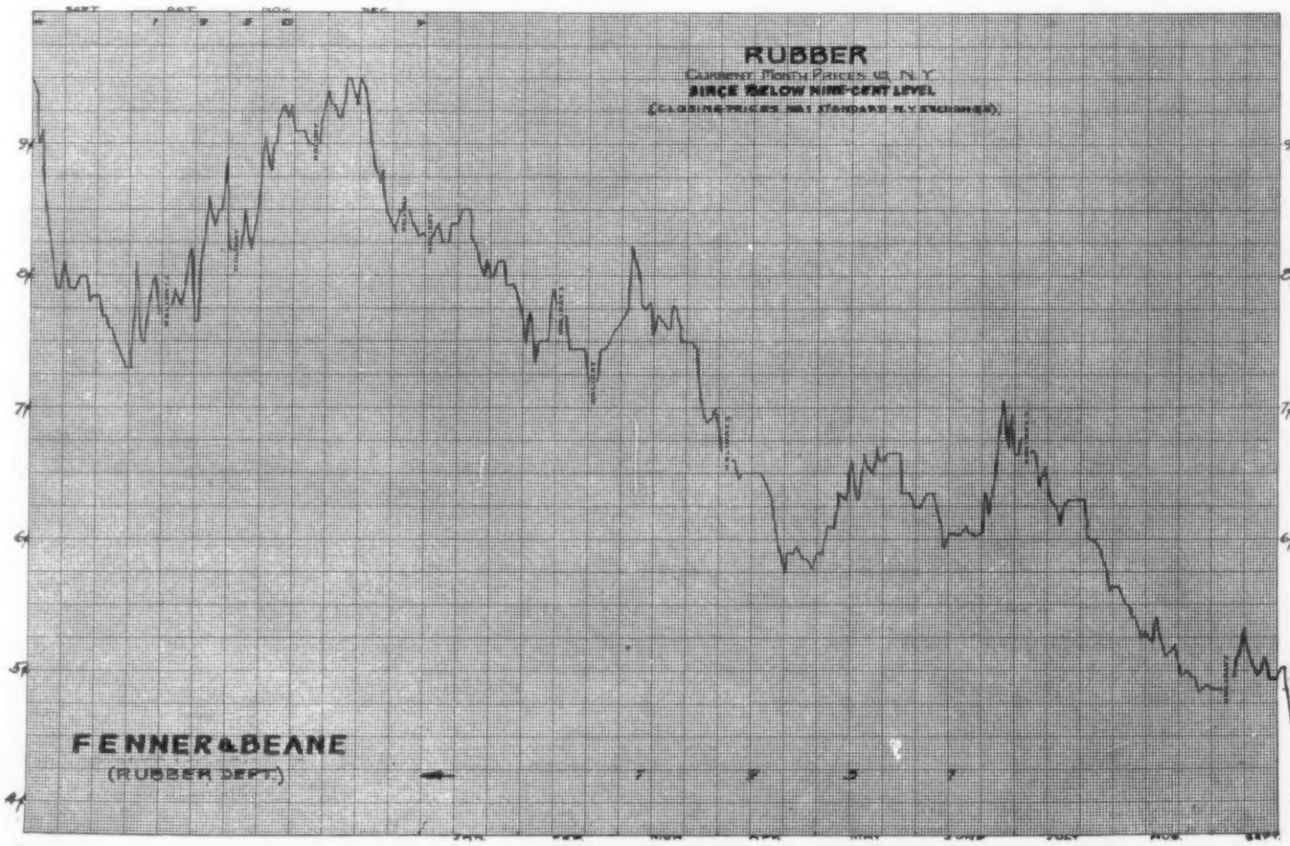
AN ANALYSIS *of the Present Depression in* CRUDE RUBBER

The Price Chart Shows Four Significant 'Double Bottoms' Have Been Reached and Passed Since Crude Rubber Struck the Nine Cent Level — The Effect of the Silver Situation as a Disturbing Factor

By CLIFFORD C. JOHNSTON
Rubber Consultant, Fenner & Beane, New York, N. Y.

NOW that rubber consumption throughout the world is at ebb-tide, current predictions favor a continuation of prices below the five cent level for many months. Such predictions are prejudiced by the prospect of general business conditions throughout the world remaining dormant. In weighing these prophecies consideration should be given to the readjustment of rubber prices during 1928 and 1929 when prices on the stock exchanges were soaring. This readjustment followed a further severe decline in rubber prices in 1926 and 1927 which caused a re-orientation of the views of the experts who in 1926 were of the opinion that 37 cents a pound was an economic price below which rubber production would be automatically curtailed. Except for a year-end rally in 1930 prices of the commodity have been readjusted below the 9 cent level for the past twleve months.

Chart readers regard as significant the series of "resistance points" that have marked the "double bottoms" occuring below the 9 cent level. A double-bottom was reached at 8⅜ and 8¼ cents before the 8 cent level was broken through; at 7⅜ cents and 7½ cents before the seven cent level was broken through; at 5¾ and 5⅞ cents before the "resistance points" permitted prices to break through the six cent level. These chart readers point to the low prices of 4⅞ during the last week of August) and 4½ (during the last week of September) as marking



The above chart indicates the four double bottoms that chart readers point to having been reached during the first nine months of this year

another "double-bottom," but they are by no means unanimous that the 4 cent level will be broken through.

The same authorities who in 1926 claimed that 37 cents a pound was an economic price for rubber now claim that rubber for many years will be produced below the six cent level. Because some efficiently operated estates have desired to broadcast their efficiency to shareholders and others, it has been more recently assumed by the layman that the all-in-all costs published by these efficient estates apply to the entire planting industry. That this assumption is fallacious is known to the readers of this article who are aware that,

(1) the thousands of estates of varying sizes and the thousands of native gardens in the various Far Eastern countries differ as much as to geographical, climatic and soil conditions and labour conditions as their costs of production vary;

(2) production costs during these abnormal times will not always remain as low as they are at present..

Here are the exact figures for a medium size estate (about 1,000 acres) that is producing an average of 530 pounds to the acre under the A B C D system of tapping. The cost of landing rubber in New York from this estate in 1929 was 8½ cents a pound. The lowest cost at which they can produce today is 4 cents a pound made up as follows:

Collection	2¼	cents
Manufacturing	1½	"
Salaries	¼	"
	4	cents

These are bare production costs. Before the rubber can be consumed in an American factory it must be packed on the estate, transported to a shipping point and placed on board an ocean going vessel. Besides this expense, there are such necessary expenditures as ocean freight export duty, income tax, land rent, insurance and agency fees. Other necessary expenditures which cannot be long deferred are those for weeding, hospital fees, sanitation and amortization charges. Including all of these necessary charges as well as interest on mortgage indebtedness, the production cost of this estate is over 7 cents a pound. The all-in-all cost of this estate (which compares favorably with the low "all-in-all" figures some times given publicity in the London share markets) is by no means typical of the operating costs of hundreds of larger estates in British, Dutch and French territory whose production costs are admitted to be above 4d. a pound. Thousands of small native gardens in Malaya, which before the slump had only tapping costs to consider are now weighed down with heavy interest payments against loans from chetties (Indian money-lenders charging exorbitant rates of interest). Thousands of acres in Djambi cannot be profitably tapped because of the scarcity of imported labor in this and other out-of-the-way districts. In many districts there is more rice for the native who grows his own than for his neighbor who buys his with the proceeds of rubber tapping. To state that rubber will continue to be over-produced at 1931 prices in 1932 is to state that efficient and inefficient producers as a whole will continue during next year to operate at a loss. To state that production costs of rubber will remain at present abnormally low levels for many years to come is to state that silver will continue to sell at abnormally low levels during this period and that no readjustment of the international gold situation will be made.

The subject of restrictions, like Banquo's ghost, has continued to reappear at critical times since the Stevenson export restrictions were rescinded at the instigation of a committee of British bankers. Its continued reappearances have had the effect of increasing production and consequently reducing prices. It is apparent, that sooner or later, voluntarily or involuntarily, restrictions of some sort will be forced upon the producers by long-continued uneconomic prices. A stabilization of monetary systems, and in particular a maintained advance in silver prices, will encourage British and Dutch bankers to at least lend a tacit consent to such artificial restrictive measures that may be necessary to save the producing end of the business from serious harm.

The Silver Situation

In an article on the silver situation featured in the April 2, 1930, issue of the Journal of Commerce, the writer stated that the increasing demand for gold had, to a greater or less extent than the decreased demand for silver, affected the prices of Far Eastern commodities and encouraged over-production but inasmuch as gold prices are fixed by government fiat, he added that the relation between falling commodity prices and falling silver prices was more apparent. The greater dependence of the Far East upon silver made this part of the world more vulnerable to the effects that were bound to result from the growing mal-adjustment of the world's gold and silver. Disturbances in the Far East more directly traceable to the silver situation have been followed by serious disturbances in Europe that can be more closely associated with the gold situation.

The recent decision of the leading Nordic nations of Europe to limit their sales or exports of gold has placed on the front page of his newspaper a subject as bewildering to the man in the street as the Einstein theory. The complexity of the subject to his mind has not encouraged his confidence that an adequate adjustment can and will be made by international bankers and statesmen. Until the public here and abroad is convinced that the situation is well in hand the commodity markets may lack the needed speculative buying so helpful in times of excessive overproduction when manufacturing-buying is limited by available cash if not by caution and storage facilities. Legitimate speculative buying on a large scale when it comes will be a benefit to manufacturer, producer and speculative investor alike.

Photoelastic Studies on Rubber

THE methods of photoelastic analysis are being employed to arrive at the stress distribution in rubber bodies in a state of strain, through experiments carried on by the Bureau of Standards, Washington, D. C. This use of the photoelastic method is of interest since the stress-strain relation for rubber takes it out of the sphere of ordinary elastic theory. Photoelastic theory, however, has nothing to do with elastic constants, its fundamental equation being an equation of equilibrium. Thus, it affords a method for the study of stresses in a plane section of any transparent material.

Rubber has a high optical coefficient and transparent samples yielding brilliant interference patterns are easily obtained. The range of color orders covers only a small range of stresses so the analyses have not been made beyond elongations of 200 per cent.

The dumb-bell shaped tensile test specimen has been studied and is found to exhibit a stress distribution similar to but not identical with that of a more rigid specimen such as celluloid. Other studies are in progress such as the investigation of stress distribution around models of pigment particles vulcanized in sheets of transparent rubber.

Applications of RUBBER *on* BRITISH RAILWAY CARS*

A Total of 608 Pounds of Rubber is Used in Each Coach of the London, Midland and Scottish Railroad—Railway Engineers in Cooperation With the Manufacturers Are Finding More and More Uses

COMPETITION with highway transportation has created such a demand for improved travel conditions that railway engineers have greatly improved the "quality of the ride." They are constantly striving after greater traveling comfort by insulation from vertical shocks, horizontal shock due to sudden change of speed and elimination of irritating noises. Finality, however, has by no means been reached. While searching for ways and means to improve travel facilities, railway engineers have continuously to consider the reduction of maintenance charges, particularly on rolling stock. To this end rubber has played an increasingly important part.

Some modern eight-wheeled passenger coaches in Great Britain use over six hundred pounds of manufactured rubber, while a locomotive and tender unit sometimes makes use of nearly one hundred and fifty pounds.

The successful development of new uses for any product entails much painstaking work. The employment of rubber on British railways today may be taken as a typical example. It is the result of the combined experience of railway engineers and the rubber manufacturers.

The use of rubber in the rolling stock of British and foreign railways has increased during this century to such an extent as to form a substantial outlet for the product of the plantation.

A review of British railway practice reveals that many entirely satisfactory applications of rubber are not generally adopted and that some railway companies use about twice as much rubber per coach as others. This indicates that full advantage is not being taken of the proven merits of rubber, apart altogether from the development and introduction of new applications.

Specific Applications

Owing to the wide difference of practice between one British railroad and another it is instructive to analyze present rubber usage on standard passenger coaches and examine the principal points of application. By way of explanation, it is pointed out that the weights given for rubber parts in the following remarks, refer to the standard coach of the London, Midland and Scottish Railway. A total of 608 pounds of rubber is used on each coach.

RUBBER DRAW-BAR AND BUFFER SPRING GEAR. The weight of rubber employed in the draw-bar and buffer spring gear amounts to 210 pounds, or one-third of the total rubber used on the coach.

AUXILIARY SUSPENSION SPRINGS. The almost universal practice of British railway companies is to use three or more superimposed rubber-metallic rings to take the load at each end on the hangers of the half-elliptic springs. This accounts for 144 lbs. of rubber. In view of this extensive employment of rubber for auxiliary suspension springs there is not much room for increased usage at these points.

BRAKING SYSTEM. Now that the vacuum brake has been generally adopted on British railways, and the rubber used in its construction standardized to a considerable extent, there is little likelihood of an increased use of rubber on passenger stock. There is, however, room for development along new lines, e.g. in bushes for brake-linkage gear and in the brake blocks in combination with asbestos and metal. A certain amount of investigatory work has been done but apparently has not led to extensive application of rubber. Vacuum brake fittings amount to 9 lbs. per coach.

HEATING SYSTEM. In the heating system flexible hose for the connections, and rubber jointings are used. As these are closely standardized there does not appear to be much prospect of increasing the usage per coach. The weight of rubber goods used in this section amounts to 13 lbs.

BODY PACKING. This type of packing which consists of a rubber pad interposed between the under-frame and the body is already considerably used and totals 65 lbs. per coach. The quantity absorbed on each railway is not the same, and there appears, therefore, to be room for the more general adoption of these pads as well as for an increased employment per coach for the reduction of noise and vibration. Rubber enters into competition with other body packings and co-operative research work would seem to be necessary between railway engineers and rubber manufacturers in order to obtain the best results. In this connection it might be desirable to carry out experiments with sponge rubber.

DOORS AND WINDOWS. The use of rubber in door construction includes door stops and window rests. Doors have of necessity to be rigid in order to retain their shape and for draught exclusion, so that prospects of increased rubber usage on conventional doors would seem to be confined to draught tubing. A pressed steel door having rubbered edges to prevent rattled and exclude draughts could possibly be supplied on a commercial basis.

Rubber rests to prevent damage when the window is allowed to fall are now universally adopted. Rubber beading for windows also gives good results and is equally generally applied. It has been found that coaches not fitted with rubber beading are appreciably dirtier due to grit penetrating through the window frame guides. Rubber window straps are also being used. The approximate weight of rubber used in this section amounts to 8 lbs.

AISLES. The use of rubber is not standardized by a number of railways although a standard coach on the L. M.

Tenders in Great Britain are frequently fitted with auxiliary springs at each end of their half-elliptical springs.

**The above article is taken from "Rubber and Roadways," written by Colin Macbeth and published by the Rubber Growers' Association, Inc., London. Appreciative acknowledgment is herewith made to both Mr. Macbeth and the Association.*

Rubber Articles Used on Carriages and Freight Cars of the London, Midland & Scottish Railway Company

Auxiliary Bearing Spring.
Springs Used on Draw-bar Gear.
¾-in. Vacuum Brake Hosepipe.
Cushions Used for Supporting Body on Main Underframe Members.
Springs Used on Buffer Gear.
Automatic Vacuum Brake Piston Rod Gland Washer.
Glass Frame Rest.
Delivery Hose, Various Sizes.
Automatic Vacuum Brake-Coupling Hosepipe.
Westinghouse Brake Coupling Hosepipe.
Steam Heating Coupling Hosepipe.
Brake Valve Washers.
Joint Rings.
Automatic Vacuum Brake Piston Rolling Ring.
W. C. Hopper Joint Ring.
Brake Valve Diaphragm Washers.
Door Stops.
Hose-Coupling Washers.
Gauge Glass Packing.
Double-Acting Valve Diaphragm.
Joint Ring for Lavatory Tank Funnel.
Beadings.
Aisle Mat.
Accumulator Box Sheet Pad.

S. uses two rubber mats weighing 14½ lbs. The mats offer a sure footing to the passenger at a point where much side swaying often occurs, while acting as a means of reducing noise and draught.

LAVATORIES. Some nineteen pounds of rubber goods are utilized in the lavatories; the great bulk of this usage being for flooring.

LIGHTING SYSTEM. Rubber sheeting as a packing below accumulators and in ebonite battery boxes may be included in the lighting system in which a surprisingly large quantity of rubber insulated electric cables is also used. These three items account for 125½ lbs. of manufactured rubber.

It may be as well here again to remind the reader that the preceding information, based on the L. M. S. Railway Company's standard bogie coach, does not necessarily represent the practice of all British railway companies. Thus one company which is not fitting rubber buffers and draw-bar springs is not averse to them, while another is definitely not in favor of them. Some companies fit as many as sixteen rubber bolster stops to their coaches while others, e.g. the L. M. S., fit none. Some fit bolster spring pads of rubber and others do not. Some railway companies fit more body packings on sleeping coaches than on day coaches, while others do not. The Great Western Company does not use rubber for either draw-bar or buffer springs, and as it possesses about 10,000 passenger coaches a simple calculation demonstrates what this would mean if rubber gear was adopted.

The use of rubber flooring is on the increase principally in the de luxe main line trains. Solid or sponge rubber is usually employed, although in some cases a sponge rubber underlay is used below an ordinary carpet. These special trains in their equipment can be considered as indicating the direction in which companies feel they can best cater for the greater comfort and satisfaction of passengers. It would appear logical that any substantial reduction in the cost of such rubber equipment will lead to its early adoption for passenger cars generally. It is claimed by users that, in addition to increased comfort, the installation of rubber flooring has demonstrated greater cleanliness, resistance to wear, and low maintenance charges.

Freight Cars

Rubber is not used to so great an extent in freight cars as in passenger coaches, yet there are many points of application such as draw-bar and buffer springs, auxiliary suspension springs and brake gear, which are accepted by some railway engineers as entirely satisfactory. In some instances rubber draw-bar and buffer springs are used in freight cars, particularly on fast freight trains.

Brake gears are generally hand operated and are not fitted with rubber. Fast freight trains in some cases have vacuum brake systems and are then fitted with rubber draw-bar and buffer gear.

Locomotives and Tenders

It will be appreciated that the application of rubber in locomotives is much less than in passenger coaches, although one British line uses 124 lbs. of rubber goods on every express locomotive and tender. The main points of application are draw-bar gear; buffer gear; auxiliary bearing springs; braking system; heating system; gauge glass packings; jointings; drivers' platform springs; coal washing hose.

Many locomotive engineers in Great Britain are satisfied that rubber cushions suitably disposed at their spring ends are beneficial as regards riding qualities, low maintenance cost, and reduction of track damage. There is still room, however, for a very considerable extension of such usage before it applies to the bulk of locomotove stock.

From a study of the above-mentioned applications it is apparent that locomotive engineers who have articulated the springs of driving wheels have been satisfied with rubber cushions when fitted at only two points of the spring linkage system. Rubber is used below each spring in designs which have individually sprung axles and has evidently given a satisfactory result with less mechanical complication. A combination of both types—articulated and rubber sprung—would be well worth adoption, and a suitable rubber unit should be capable of standing up even to American axle loads and track conditions.

It has been found that when rubber auxiliary bearing springs have been fitted, the breakage of spring hangers has been greatly reduced, if not entirely eliminated. Drivers prefer locomotives so fitted owing to the reduction of vibration. The reduction of damage to permanent way due to the softening of the blow on rail ends must be appreciable, although it is difficult to prove.

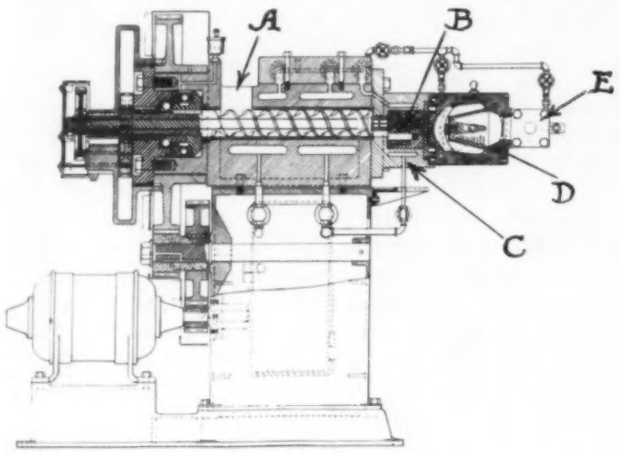
Many British railways now provide auxiliary rubber springs on their locomotive bogies. In some cases they are arranged at the bottom anchorage of the spring hangers where equaliser beams are used. The application of rubber pads at the base and top of helical springs which take the load from a spring beam has been adopted by more than one British system. Forty rubber bearing spring pads are used on each Great Western Railway bogie.

Australian Rubber Industry

ACCORDING to the latest despatches received by the Department of Commerce rubber manufacturing plants in Australia making tires and mechanical rubber goods have been running at hardly more than 25 per cent of normal, in recent months. Some time ago James Henty and Company of Melbourne began manufacturing the raw stocks of the former Rapson Tyre Company at Launceston, Tasmania. They inaugurated a mail order business selling for cash. It is said that the lower prices at which their tires were sold were factors influencing the Australian Dunlop and Goodyear firms in manufacturing their second line tires locally.

Johnson Tuber and Strainer

MANY interesting features are embodied in the new Johnson super tubing and straining machine, which is being offered to the industry by Corone Wire Insulators, Inc., Putnam, Conn. The general appearance and construction of the machine is not unlike the old type of worm feed tubing machine but is of less massive construction due to requiring less power. Added to the equipment of the standard type of machine is a geared pressure boosting apparatus, in principle like a rotary gear pump, placed at the delivery end of the stock worm where the rubber delivered to the worm enters a chamber through



a large opening, requiring only slight pressure. From this chamber the rotating gears carry it to the high pressure chamber, from which it is discharged at a pressure many times greater than possible to build up with the stock worm alone and at the same time insuring constant measured volume from the action of the geared pressure boosting element.

As can be noted from the accompanying illustration the stock is fed into the machine through the hopper opening A and advanced by the stock worm to the pressure boosting element B, which is encased in a jacketed housing C. The stock is forced by the booster through the temperature controlled, quick changing strainer magazine D and onward through the insulating die section E.

The pressure boosting element consists of a pair of gears, the revolutions of which force the stock with rapidly increasing pressure against the strainer. According to E. H. Johnson, the designer of this new machine, the action of the booster eliminates burning of the compound and the high pressure positive movement of the material makes for greater efficiency in the straining and extruding operations.

The manufacturers claim that the machine has a capacity of from 20,000 to 50,000 feet of insulation per hour according to the size and wall of rubber.

Rubber Suspension in Automobiles

A NOVEL form of independent wheel suspension, known as the Harris-Leon-Laisne, and which has been developed with success in France, is reported in *Commercial Motor* of England. Up to the present time it has only been used on custom built cars.

The road wheels are articulated to the chassis by means of tubular, forged-steel levers. From the inner end of each of these levers a small arm extends downwards and connects up with what is virtually a piston rod—the disc, or "piston," mounted on this rod working in a cylinder filled with rubber. The rubber is in the form of rings, which diminish in size as they reach the piston, thus allowing space for lateral expansion of the rubber under compression. The movement of the wheels under the influence of road shocks is vertical, and this is converted to a much smaller horizontal action. On the outer side of the disk further rubber rings function as a rebound damper.

Another type of automobile suspension almost entirely on rubber springs is reported through the Department of Commerce, from the advices of the U. S. consul at Newcastle-on-Tyne. The main feature of the idea is that the car is sprung on specially prepared rubber of high elasticity and practically dispenses with the metal springs.

Thermal Conductivity of Rubber-Filler Systems

A STUDY of the effect of fillers on the thermal conductivity of rubber is in progress by the Bureau of Standards. The fillers which have been investigated are powdered graphite, calcium carbonate or whiting, and zinc oxide. Test specimens have been made using these fillers in a relatively wide range of proportions. Measurements of the thermal conductivity of the graphite specimens were made by a primary method and these specimens were used as standards for obtaining the conductivity of the other specimens by a comparative method of test which was developed and described by committee D-9 of the American Society for Testing Materials.

The results that have been obtained indicate that the thermal conductivity of a rubber-filler system is not a simple linear function of the per cent of filler, but rather that the conductivity increases slowly with small percentages of filler and more rapidly as the proportion of filler becomes large. No general means for accurately calculating the conductivity of a rubber-filler mixture from the conductivities of its components has been found.

Rubber Committee for Unemployment Relief

A. L. VILES, general manager of the Rubber Manufacturers Association, who is chairman of the Rubber Committee of the Emergency Unemployment Relief Committee's division of Commerce and Industry, recently issued a statement at headquarters of the committee, 29 Broadway, explaining how his division will operate in raising funds in Manhattan for the relief of acute distress resulting from unemployment in New York.

The general campaign, according to present plans, will be divided into three divisions: Special Gifts, Commerce and Industry, and Women's Committee. The special Gifts Division will seek large contributions from persons who heretofore have aided welfare enterprises in the city, and the Women's Committee, headed by Mrs. August Belmont, will solicit entirely within their own groups.

The Commerce and Industry Division, headed by Myron C. Taylor, will seek contributions from commercial, financial and industrial organizations within the city. Executives of these organizations will be asked by the committee to make individual gifts. Corporations through their boards of directors will be asked for corporate gifts, and employes will be given the opportunity to contribute small sums commensurate with their incomes.

EDITORIAL COMMENT

The Romance of Rubber

IN these days of discouragement and pessimism there is very little solace that can be gleaned by the rubber trader from the various sources of figures which portray the statistical position of crude rubber as a commodity. And yet, in the cold calculations set down, as representing the monthly production from the several producing areas, there is an infinite field for thought and speculation. The romantic side of the rubber producing industry lies within those figures. Behind those cold statistics, breathes a thrill for every rubber man who has trod under the flowering canopy of a well-kept plantation estate; who has been up with the sunrise to supervise coolie labor; who has bartered with native rubber growers, or who has otherwise lived and suffered in the torrid heat of the tropics in producing this important commodity. In reading the monthly import figures of the Rubber Manufacturers Association, for instance, few realize the romance back of these tabulations. The very names of the ports of shipment bring back recollections. Singapore and the cool verandah of the Raffles Hotel, where the rubber men of the estates and the representatives of the American manufacturers swap yarns over their gin pikts; Penang, with its temple of the sacred snakes; Colombo, with its seething population and the beautiful estate of the late Sir Thomas Lipton, up in the mountains at Kandy; Batavia and Belawan-Deli, breathing of the subtle odors of the Orient and displaying the exquisite Batiks of Javanese artistry in the market places; Sourabaya and Malacca, recalling all the thrilling adventures of Joseph Conrad's stories; Zamboanga, where the "monkeys have no tails" and where one lives a lazy life on the porch of the club looking through the Basilan Straits to the quiet Sulu Sea,—where one gets ice cream made from fresh cocoanuts.

And then from the other sides of the world,—Manos and Para, where Sir Henry Wickham secured what probably resulted in the greatest bit of agricultural plunder in the history of the world; Monrovia from whence our own Mr. Firestone is bringing rubber from his American plantation project in the heart of Africa.

Such is only part of the romance back of crude rubber production.

Aid to the Unemployed

AS a contribution to the nation-wide efforts for the assistance of the unemployed, THE RUBBER AGE has inaugurated a service beginning in this issue, by which the unemployed with past experience in the rubber industry may bring their story, through classified advertisements, to the attention of the manufacturing plants now in operation. THE RUBBER AGE is happy to be of this service in this time of distress. But it, alone, cannot bring the desired results to these deserving unemployed without the wholehearted cooperation of the industry. Jobs must be made available for these men. It is the duty of the industry to respond. Certainly, a search through the organization of every operating rubber plant will disclose some opening available to one of these experienced workers. A more concrete contribution to the alleviation of the present situation could not be made than to add one or more of these men to your organization. Help these men now—they who have done so much in the past to place the rubber industry on the high plane it has reached in the industrial structure of our country.

Rubber Costs

SOME interesting figures come from Mincing Lane on the 'lowest possible actual cash outlay for the production of crude rubber.' The following is the estimate made:

Tapping: 1d. per lb.
Drying and preparing: ½d. per lb.
Carriage to Seaport: ½d. per lb.
Packing and freight: ¾d. per lb.
Landing and expenses: ¼d. per lb.

This gives a net cost of 3d. (6 cents) per pound, aside from all overhead charges. Native growers, on the other hand, are said to be able to produce rubber for as little as 2½d. (5 cents) per pound. It would seem, therefore, that the native growers are only now beginning to feel a financial loss,—a fact which may be instrumental in substantially slackening the rate of production during the next few months. Without capital reserves to fall back on the native can withstand losses only for a short time.

The RUBBER AGE

Published on the 10th and 25th of each month. The Only Twice-a-Month Rubber Publication.

THE PALMERTON PUBLISHING CO., INC.

Editorial Office, 250 West 57th St., New York City

Telephones: COlumbus 5-2923, 5-2924

THE RUBBER AGE is published on the 10th and 25th of each month by The Palmerton Publishing Co., Inc., a New York corporation. P. L. Palmerton, President; Earl D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer. Publication Office, 1-3 Peace St., New Brunswick, N. J. Subscription rates: Domestic, $2.00 a year; Canada, $3.70; foreign, $3.00; single copies, up to 3 months old, 20c; over 3 months old, 50c. Advertising rates on application.

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THE RUBBER AGE is indexed in *Industrial Arts Index*

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

FIRESTONE WILL BUILD WESTERN BATTERY PLANT

The Firestone Tire & Rubber Company will expend approximately $100,000 on a new factory devoted to the manufacture of storage batteries for distribution in the western territory, according to an announcement by R. J. Cope, vice-president of the California subsidiary.

The new plant will be constructed on the 40-acre site of the Firestone tire factories at Los Angeles and will adjoin the tire manufacturing unit near South Gate. It will have a capacity of 1,200 batteries a day, according to the announcement.

TIRE AND RUBBER PLANTS SHOW GAINS AT TRENTON

A recent survey of tire and rubber manufacturing companies at Trenton, N. J., has revealed that in some of those employing rather large numbers of men ordinarily there has been an improvement in employment conditions in the past few months.

For several months the Murray Rubber Company has been operating in a satisfactory way, employment officials announced. It was pointed out that this covered the automobile tire season, and that the concern is now running into its months of slack business. However, it is not anticipated that this will seriously affect employment conditions there. The concern has about 500 employees at work, and it is the aim of the company to keep all of its employees working even in the slack months. Working hours will be somewhat shortened. The Murray plant is operating on a five-day week.

At the Puritan Rubber Company it has been found that business is spotty with a pick-up and then a decline. The company is operating on a five-day week and, when occasion demands, more than that. Most of the concern's former employees have been returned.

New Golf Ball Size

Effective April 15, 1932, the official maximum weight limit for golf balls will be raised from 1.55 to 1.62 ounces, according to a decision of the United States Golf Association. The size will remain unchanged at 1.68 inches. Present stocks of balls in the hands of dealers and manufacturers will still be marketable after that date, as the specifications set only a maximum limit and any lesser weight is satisfactory.

Safety Men to Assemble

Members of the Rubber Section of the National Safety Council will meet at the Stevens Hotel, Chicago, Ill., from October 13 to 15. The complete program of papers and reports to be presented was published in the September 10 issue of THE RUBBER AGE.

Goodrich Directors to Meet

The second meeting of directors of the B. F. Goodrich Company to be held in Akron this year is scheduled for October 13. The directors will asemble during the forenoon of that day and expect to devote the entire day to their session.

Pioneer Opens Attica Plant

The factory of the Pioneer Rubber Company, maker of toy balloons and rubber novelties, at Attica, O., was reopened September 21 after being closed for several months. Two shifts of workers were started on day and night shifts. It is reported that the company's second plant at Willard, O., has been shut down temporarily.

To Make New Absorber

The Corozone Company has established a new factory at Cleveland, O., for the manufacture of a vibration absorber for Ford automobiles. Rubber parts for the device will be made by an Akron manufacturer and assembled at Cleveland.

Seiberling Rubber Ad Agency

The Seiberling Rubber Company, Barberton, O., has appointed Young & Rubicam, Inc., to act as its advertising agency. Space will be used in trade papers, general periodicals and newspapers.

DUNLOP TIRE & RUBBER WORKING ON FULL TIME

Return to a full-time working schedule for all employees was announced September 28 by officials of the Dunlop Tire & Rubber Corporation, Buffalo, N. Y. Increased orders for tires as the result of a current sales drive are responsible for the shift from the four-day-a-week schedule that had previously been in force, it was announced.

Officials said that the full-time schedule would remain in effect for at least two weeks and possibly longer, because the sales campaign is just sweeping into its stride. It was stated that employment at the plant had reached its peak at the end of September.

ROESSLER & HASSLACHER CHEMISTS TRANSFERRED

The following members of the research staff of the Roessler & Hasslacher Chemical Company, Inc., have been transferred from the plant at Perth Amboy, N. J., to the Niagara Falls, N. Y., plant within the past three months: Dr. Sterling Temple, Dr. B. S. Lacy, Dr. A. M. Muckenfuss, Dr. J. F. Reichert, Dr. C. J. Wernlund, A. T. Hawkinson, A. W. Rudel, J. M. Wainscott and H. A. Bond.

Other transfers to the Niagara Falls plant from Perth Amboy include P. M. Paulson, patent specialist, and M. Marean, librarian. I. L. Ressler, entomologist, has been transferred to Niagara Falls from the company's New York office.

AID TO THE UNEMPLOYED BRINGS COMMENDATION

Hardly had the September 25 issue of THE RUBBER AGE been mailed to its subscribers when replies were coming in from technical men and executives who desired to take advantage of this paper's offer to publish free want advertisements for the unemployed in the rubber industry.

The letters which accompanied the want ads almost invariably commended this paper for its far-sighted policy of assisting the unemployed.

"I wish to take advantage of your magnanimous offer . . . "

"The generous attitude on your part must meet with approval and great appreciation . . . "

"In accordance with your liberal offer . . ."

" . . . to take advantage of your very generous offer . . . "

"Noting your very generous offer . . . "

"Your kind offer has been brought to my attention . . . "

—such were some of the expressions of appreciation.

To make this effort a success, however, will require the cooperation of rubber manufacturers. Applicants with all kinds of experience are available (see page 35) and manufacturers should be able to select a man with excellent qualifications for that position which has been vacant so long awaiting the return of so-called prosperous times. Hire a man today—make an opening if necessary!

Those unemployed who have not yet taken advantage of this offer should do so without delay. See page 35 for details.

UNITED CARBON COMPANY COMPLETES GAS WELLS

The United Carbon Company has completed enough wells on its eastern Kentucky gas properties to provide for the deliveries which it has contracted to make, beginning November 1, to the Columbia Gas & Electric Corporation. The contract provides that United will deliver the first 20,000,000 cubic feet a day to go into Columbia's new pipe line to Washington, and that after a year, Columbia will take at least 30,000,000 cubic feet daily.

Results from wells drilled have exceeded the expectations of the company. As against an estimated open flow of 400,000 cubic feet a well daily, on which the company based its plans, the wells drilled average more than 1,000,000 cubic feet open flow. As a result, the estimated expenditure of $600,000 for drilling, to enable the company to meet its contract, has been reduced to an actual outlay of only somewhat more than $300,000.

The contribution to earnings from this new source will be slight in 1931, but the company expects that in 1932 at least $400,000 net will be realized. So far as its other operations are concerned, the carbon black business continues poor. Large stocks have accumulated, which must be cleared before the industry again will be in a healthy condition. Meanwhile, the United Carbon Company has been reducing production costs steadily.

Sales of gas to the various pipe lines to which the company is connected in Louisiana are running about 40,000,000 cubic feet daily, but should show at least the customary seasonal increase with the arrival of colder weather. Extensions are under way by some of the lines, which will mean a permanent broadening of the markets, while revival of industrial activity should mean sharply increased takings by customers already connected.

Davy Textile is Darex Agent

The Dewey & Almy Chemical Company, Cambridge, Mass., has announced the appointment of the Davy Textile Company, Cincinnati, O., as its representative in Ohio, Kentucky and Indiana for the sale and distribution of Darex Gold Seal cements, Darex insoles and Darex soles and heels. J. W. Davy is head of the new Dewey & Almy sales agency.

Dr. William A. Ducca

Dr. William A. Ducca, of Butler, N. J., died September 26 in St. Peter's Hospital, New Brunswick, N. J., where he had undergone a serious operation two weeks prior to his death. Dr. Ducca, who was 51 years of age, was born and educated in Germany but came to this country about 25 years ago. For the past five years he had been employed as a research chemist by the American Hard Rubber Company.

The funeral service was conducted at St. Paul's Church, Highland Park, on September 29.

He is survived by his widow, Mrs. Claire Ducca, and three children, Frederick, Genevieve and William.

Russell H. Baldwin

Russell H. Baldwin, former president of the Baldwin Rubber Company, Pontiac, Mich., died last month at his home near Birmingham after a length illness. He was 47 years of age.

Mr. Baldwin had been actively connected with the Baldwin Rubber Company until two years ago when he retired because of ill health. He is survived by his widow and two daughters.

Holt Sees Potentialities In New Applications of Rubbber

THAT the only effective cure for the present situation is for crude rubber consumption to increase considerably is the opinion of Everett G. Holt, chief of the Rubber Division of the Department of Commerce, expressed in the leading article of the September 28 issue of *Commerce Reports*. "Most trade observers consider that new uses for rubber offer the most likelihood of furnishing the necessary impetus to rubber consumption," he finds.

Mr. Holt reviews the efforts of the Rubber Growers' Association to develop new uses for the commodity, particularly its activities in behalf of sponge rubber upholstery and crepe rubber soles. He comments on the new Michelin rubber-tired rail cars and visions the delivery of merchandise without rehandling, direct from rail to the door of the consignee, merely by removing the easily adjustable flanges from the car wheels and driving the loaded vehicle to its destination.

New Uses Progress Slowly

"Before the beginning of the present depression," Mr. Holt states, "it was understood that manufacturers were considering several innovations and new applications of rubber that would be easily practicable if the price of rubber were only lower. Rubber producers find it difficult to understand why these new applications have not been announced, or why, if announced, they have not had perceptible effect in increasing rubber consumption. There are several good reasons. Some of these developments contemplated a lower price level for rubber in relation to other materials—since the depression has affected all materials more or less similarly, the lower price for rubber has still not given the necessary relative advantage in price to articles made of rubber as compared to other materials. Secondly, the financial condition of the manufacturing industry has, no doubt, made it difficult for some companies to develop their plans. Thirdly, the introduction of a new product is often a tedious process, and the general tendency toward economy in consumer purchases under present conditions makes such introductory work doubly slow. The urge for economy and lower prices has put in motion other offsetting factors—for example, all-rubber flaps for inner tubes are less common than formerly, and manufacturers of low-priced cars, in most cases, no longer use any tire flaps on new cars—which, of course, has its effect on rubber consumption.

Would Popularize Latex

"A suggestion of a rather novel nature is that liquid rubber latex might find a considerable sale if made available to the public in small tubes through the 5-and-10-cent stores. The thought, offered by a trade contact, is that the lay public has never had any direct knowledge of rubber in its natural form, and that private individuals, given the opportunity to see latex and use it for cementing furniture and similar minor purposes, might discover absolutely new applications. Use of latex directly in manufacturing processes—for dipped goods particularly—appears to be steadily gaining.

"Rubber roadways, bridge pavings, flooring, and wall board are constructional opportunities for utilization of rubber that have been the subject of much experimentation. Many observers regard possibilities in the field of construction and engineering with great optimism."

RUBBER STOCKS DECLINE TO NEW ALL-TIME LOWS

Rubber company stocks broke sharply during the past fortnight, with at least 12 sinking to new record lows in their history. Goodyear common, which had sold as high as 154½ at the peak of the 1929 bull market, collapsed to a low of 16. Goodrich common, which brought 105¾ two years ago, was traded in at a low of 5, while the company's 6 per cent convertible debentures sold at 42.

Among the other issues that went to new low levels for 1931 or longer were Firestone, Goodyear and Goodrich preferred shares, Intercontinental, Raybestos-Manhattan, Seiberling common, and United States common and preferred.

Closing prices of the stock issues of the principal companies in the industry on October 5, compared with the close on September 19 and with the high and low thus far reached in 1931, are shown in the following table:

	Last Price		1931	
	Oct. 5	Sept. 19	High	Low
Aetna	—	—	5	2
Ajax	—	—	½	¼
American Hard Rubber	—	—	35¼	30
Dayton, "A"	—	—	—	—
Faultless	—	—	37	31⅜
Firestone	15	16½	21½	13
do. 6% pfd.	51⅞	57⅞	66¼	50¼
Fisk	—	¼	⅜	¼
do. 1st pfd.	—	—	3	1
General	—	65	140	60
do. pfd.	—	75	87½	75
Goodrich	5	8	20⅞	5
do. pfd.	19¾	—	68	16
Goodyear	16⅜	32¼	52¾	16
do. 1st pfd.	58	73	91	58
India	7	—	13½	7
Intercontinental	1	⅞	4½	¼
Kelly-Springfield	1	1½	3½	1
do. 6% pfd.	—	—	45	35
Lee	2¾	2⅝	4¾	2
Mohawk	—	—	8	2¾
do. pfd.	—	—	35	25
Norwalk	—	—	1¼	½
Pirelli	27½	29	39¾	26½
Raybestos-Manhattan	9¾	14	29½	9½
Seiberling	4½	—	10¾	4½
do. pfd.	—	—	50	32
U. S. Rubber	5⅝	8¼	20¾	5⅝
do. pfd.	10½	16½	36⅛	10

Names in the News

R. P. DINSMORE, chief chemist of the Goodyear Tire & Rubber Company, has been named honorary secretary of the Massachusetts Institute of Technology to represent that institution in the Akron district. He will consult with prospective students from the Akron area and assist them in determining their qualifications for a scientific or engineering education.

DR. W. N. JONES, superintendent of the processing division of the B. F. Goodrich Company, attended a meeting of the executive committee of the American Institute of Chemical Engineering at New York City. He returned to Akron on September 21.

M. L. DOUGLAS, general sales manager of the Dominion Tire Company, has become the first "flying sales manager" in Canada, using a Gypsy Moth airplane regularly to keep in close touch with his field forces through the Dominion. Mr. Douglas, a former officer in the Royal Air Force, was for nine years following the war director in charge of sales for the Dominion Rubber Company in England, returning to Canada as general sales manager for Dominion Tires in 1929.

S. M. JETT, secretary of the B. F. Goodrich Company, accompanied by his son, ALEXANDER, DR. D. B. LOWE, head of the Goodrich hospital, and GEORGE OENSLAEGER, Goodrich research chemist, spent the latter part of September on a moose hunt in the Canadian woods. They made their hunting camp at a point two days' canoe journey north of Nakina, Ont.

CHARLES CLARK has been appointed to represent the Norwalk Tire & Rubber Company, Norwalk, Conn., in Connecticut and western Massachusetts, with headquarters at Hartford, Conn. Mr. Clark was formerly in charge of the same territory for the United States Rubber Company.

NORMAN H. KEELING, district advertising manager of the B. F. Goodrich Rubber Company in Dallas, Tex., visited the Akron offices of the company on September 24 to confer with executives of the advertising department.

WILLIAM S. BROCK, noted ocean flyer, was a guest of officials of the B. F. Goodrich Company at Akron, O., on September 15. He spent some time at the Goodrich factory and at the Akron Municipal Airport.

CARL F. JONES, district branch manager of the Dayton Rubber Manufacturing Company, Dayton, O., and J. D. ROCKOFF, of the company's chemical department, were guest speakers at the luncheon meeting of the Rotary Club of Xenia, O., on September 15. They discussed the origin of rubber and the manufacture of tires, illustrating their talks with samples of rubber in the various stages of manufacture.

GOODRICH SHIFTS HEADS OF MECHANICAL DIVISION

Changes in the mechanical rubber goods sales division of the B. F. Goodrich Co. were announced September 30 by J. H. Connors, vice-president and general manager of the mechanical division.

W. S. Richardson, formerly staff superintendent of the division, becomes merchandising manager, and is succeeded by J. B. Hanan. Mr. Richardson will be in charge of all products sold through the Goodrich, Diamond, Hood and Miller mechanical sales divisions.

Mr. Richardson joined Goodrich in 1926 as a planning engineer of the mechanical division. Eighteen months later he was made manager of receiving and warehousing and manager of the service department. A year ago he was made staff superintendent of the division under G. L. Matthias, superintendent.

Mr. Hanan, formerly Akron school board member, became associated with Goodrich in 1918 after teaching school in Portage County. He has held the positions of assistant correspondence superintendent, office manager, and service department manager.

Other mechanical goods sales managerships announced by Connors are: B. J. Brooks, operating manager; C. F. Conner, sales promotion manager, and A. W. Doran, distributor sales manager.

Products sales managers are: L. H. Chenoweth, hose, tubing, etc.; E. R. Miller, molded goods; L. Q. Moffitt, cutless bearings; D. N. Hill, hard rubber; H. E. Fritz, chemical sales; R. McPeake, Diamond Rubber; P. W. VanOrden, belting; E. Peterson, rubber rolls; J. F. Johnston, Miller Rubber; W. Brown, Jr., Hood heel, sole and sundries sales; J. Smith, Hood hard rubber and asphalt; and J. M. Failey, miscellaneous products sales.

C. E. Cook is general sales manager of the division.

G. R. REITER, manager of the production control bureau of the Goodyear-Zeppelin Corporation, Akron, O., spent his vacation last month at his home town, Moundsville, W. Va.

GEORGE MADOLE, assistant managing director of the Societe Francaise B. F. Goodrich, Colombes, France, has returned to his post after several weeks in Goodrich headquarters at Akron. He sailed from New York City on September 26.

DR. WOLFGANG B. KLEMPERER, manager of the research department of the Goodyear-Zeppelin Corporation, and Karl Helma, manager of the stress analysis division, were admitted to American citizenship at Akron on September 25.

W. G. KEARNEY, A. A. ROBB and C. H. RUSSELL, of the sales department of the B. F. Goodrich Company, attended the sessions of the American Electric Railway Association convention in Atlantic City, N. J., during the week of September 28.

C. W. LEGUILLON, manager of machine development for the B. F. Goodrich Company, and G. L. MATHIAS, mechanical goods superintendent, left Akron September 19 to make camp several hundred miles north of Montreal on a hunting and fishing expedition.

FREDERIC V. LARKIN, long associated with the rubber industry in this country and abroad and who for the past seven years has represented the Roessler & Hasslacher Chemical Company as technical representative, Rubber Division, in the eastern part of the United States and Canada, has joined the staff of Wishnick-Tumpeer, Inc., acting in a similar capacity. He will make his headquarters at the New York office of Wishnick-Tumpeer, 251 Front Street.

J. A. HOBAN, merchandise manager of Goodrich Silvertown, Inc., retail division of the B. F. Goodrich Company, has been made manager of the Goodrich pneumatic tire sales division, working directly under W. C. BEHOTEGUY, merchandise manager of the tire division, it was announced by C. B. O'CONNOR, general tire sales manager. Mr. Hoban joined Goodrich September 15, 1919, in a sales capacity. In 1926 he was made branch manager at Pittsburgh and in 1929 was sent to Chicago as zone manager for Goodrich Silvertown, Inc. The first of last year he was made retail zone manager for that district and March 1 this year assumed the position of merchandise manager of the retail division.

M. C. BACON has been appointed as special representative of the tire department of the United States Rubber Company, Detroit, Mich. Mr. Bacon has had 14 years of experience in the puncture sealing tube business, having been associated with the McWade Automatically Sealed Tubes at Garrettsville, O., when that company pioneered that type of tube, and later with the Polson Rubber Company, which took over its business. He will devote his attention to the development of puncture sealing tube sales.

S. M. KIPP, plant engineer of the B. F. Godrich Company, has been placed in charge of building maintenance, new construction, engineering stores and elevator operation for the main Goodrich factories at Akron, according to an announcement by H. E. COOK, general superintendent of the engineering division of the company. Mr. Kipp has been with the Goodrich company since 1918 in various engineering capacities.

JAMES E. PEKAREK, sales manager of the footwear division of the United States Rubber Company, addressed the Lions Club of Canton, O., on September 30.

Rubber News Around the World

DUNLOP RUBBER COMPANY OMITS COMMON DIVIDEND

The Dunlop Rubber Company, Ltd., has omitted the interim dividend on its common or ordinary shares, due at this time. The company stated that this action was decided upon, owing to the uncertain outlook, and that declaration of preference dividends can only be considered when accounts for 1931 are complete.

Sir George Beharrell, managing director, states, however, that the dividend omission does not mean that the trading position of the company is unsatisfactory, but that directors considered it prudent to await results of the whole year. Production is being maintained in every country, he said, but the outlook is uncertain, particularly regarding exchange. The financial position of the company is strong, and liquid resources have increased materially, he indicated.

In April, Dunlop passed its final dividend on the common shares for 1930. Total common dividends amounted to 6 per cent in 1930 as compared to 15 per cent in 1929.

I. R. I. OPENS MEETINGS WITH VARIED PAPERS

A meeting of the Midland Section at the Grand Hotel, Birmingham, on October 1 opened the season of the Institution of the Rubber Industry. A paper was read by Alexander Johnston, F.I.R.I. This group will hold its second meeting on October 22 at the Grand Hotel, Leicester, and will hear a paper by B. W. Dunsby, F.I.R.I., on "Inner Tubes for Pneumatic Tires."

The West of England Section assembled at the George Hotel, Trowbridge, on October 7 to hear Dr. D. F. Twiss discuss "Concentration and Compounding of Latex for Industrial Use." The Manchester Section gathered at the Manchester College of Technology on October 8 to listen to a paper by R. Maitland, entitled "A General Review of Synthetic Resins."

The members of the London and District Section will resume their sessions on October 12 at the First Avenue Hotel, London, at which time A. E. Osborn will discuss "The Advantages and Disadvantages of Technical Training for Salesmen in the Rubber Industry." Dr. E. A. Hauser is scheduled to be the speaker at the meeting of the Scottish Section at the Caledonian Hotel, Edinburgh, on October 13.

August Golf Ball Imports

Imports of golf balls into the United States during August numbered 38,388 balls, valued at $13,301. This compares with July imports of 72,516 balls, worth $24,069, and August, 1930, imports of 110,632 balls, valued at $36,103. The average value of the August imports was 34.6 cents per ball as against 33.2 cents in July and 33.0 cents in June.

Beta-Naphthol in Rubber

The aging of rubber is retarded by the addition to the mix of beta-naphthol, according to Imperial Chemical Industries. This company finds that the use of beta-naphthol causes less discoloration than other naphthols.

Fast Rubber-Tired Rail Car

A rubber-tired railway car, with which experiments are being made on French railways, broke all train speed records between Paris and Deauville on September 10, covering the distance of 133 miles in two hours. The time of regular express trains is two hours and 35 minutes. The Micheline type coach, using a Hispano-Suiza motor and special Michelin tires, averaged 67 miles an hour on the trip.

New Roads Excite Interest

More than casual interest was evinced in European rubber manufacturing circles and in the world crude rubber market in the announcement that an international motor road system will be constructed in Europe. The proposed system includes one main artery passing from Paris to Vienna and Athens; a second from Paris to Berlin, Warsaw and Moscow; and two cross routes, from the Baltic to the Balkins and a trans-Alpine artery.

CAPITAL IS SECURED TO PROMOTE ANDERSEN TIRE

Capital backing has apparently been finally secured for the Andersen tire, which has been mentioned repeatedly in Scandinavian news releases for the past two years. A Swedish-Norwegian-Danish joint stock company, backed largely by Krueger & Toll, has been formed with a capital of 3,000,000 kroner, according to Copenhagen dispatches this month.

The tire was invented after 16 years experiment by a Norwegian, Colonel A. Andersen, who says he has combined solid and pneumatic principles, with the result that manufacturing costs have been halved and wear on the tire tread reduced by 35 per cent with a corresponding reduction in road wear.

Colonel Andersen's system comprises two circular dinner-plate-shaped steel disks between the outer edges of which is compressed a circular rubber ring having a rectangular air chamber. This chamber contains, in addition to air, a proportion of liquid glycerine, which insures, according to Colonel Andersen's theory, a uniform pressure at all temperatures.

The reduction of manufacturing costs is obtained by the fact that no cording or strengthening of the rubber cover is necessary, as the steel "dinner plates" take up the lateral stresses.

A new factory in Sweden is planned, with production expected to start in three months.

PROPOSES PAYMENTS TO GROWERS WHO SHUT DOWN

The novel plan of payments to producers who shut down for a fixed period has been offered by Sir Francis M. Voules, chairman of the Kuala Muda, Kepong (Malay) and Gordon (Malaya) rubber companies, the funds for the purpose to be raised by an export tax on all rubber shipped from the Far East. Under his scheme, the British and Dutch governments would pay about ½d a pound to such growers on their estimated output. He presents his proposals as an alternative to the "unnatural procedure" of crop destruction.

Sir Francis suggests that the export tax should be fixed at ½d per pound plus an amount to cover the expenses of the governments concerned, and adds that a well known authority has recently stated that at the present price the native would receive a profit of only 3-16d per pound of rubber produced.

As the average collection per head is about 12 lb. of rubber per day, the statement continues, this represents a daily wage of only 2¼d, as against the wages paid to the Tamil coolies of between 10d and 11d a day. Clearly, therefore, it would be to the natives' advantage to receive ½d per lb. for shutting down for a fixed period of one year rather than to continue working. Sir Francis continues:

"The net exports of rubber for 1930 amounted to approximately 820,000 tons, of which 197,900 tons were produced by Malayan smallholders and 88,290 tons by Dutch native growers. If, as I anticipate, a large number of natives agree to close down for a fixed period in consideration of the payment to them of ½d per lb. of their estimated output, to be approved by an assessment committee to be appointed, it may not unreasonably be expected that the scheme would result in a diminution of output in one year of something between 100,000 to 200,000 tons."

AUGUST RUBBER OUTPUT LOWER THAN FOR JULY

Production of crude rubber on Far Eastern estates declined slightly in August from the previous month. Production on estates under 100 acres in size, largely native, amounted to 15,106 tons, compared with 15,691 tons during July. The output of estates larger than 100 acres in size, chiefly European-owned, totaled 20,941 tons, compared with 21,371 tons during the month of July.

The stock position at the close of August underwent only a minor change in Malaya. Estate stocks were reported at 23,855 tons, as against 23,116 tons at the close of the previous month, while dealers' holdings amounted to 20,126 tons, compared with 20,715 tons at the close of July.

Rubber Goods and Specialties

Electricians' Friction Tape

The mechanical sales division of the B. F. Goodrich Company, Akron, O., recently announced the development of a new friction tape, especially designed for electricians but also applicable to all uses of the ordinary product. The tape is similar to inner tube patching material and practically vulcanizes

in place after applied, making a solid covering for wire. The tape is listed by insurance underwriters and is approved for electrical use as taking the place of both insulating material and ordinary cloth tape. In developing the new product Goodrich engineers have designed this tape so that it can be rolled lengthwise around an electric wire rather than wrapped and overlapped. It is especially applicable to wiring where it is difficult to wrap the wire. The Goodrich tape is rolled over the wire as one would roll a cigaret. The edges are overlapped only slightly and the vulcanizing agents in the product react to form a tight bond.

The tape is made in ¾- and 1½-inch widths and packed in rolls. The strips are backed with "Holland," the same cloth material applied to tube patching rubber. This is removed as the tape is used. Goodrich claims the tape will insulate 8,000 to 10,000 volts, that it has remarkable adhesion, is moisture proof, will not dry out and uncoil, has uniform thickness, and great strength, resists heat, cold and abrasion, fabric cannot unravel, preferred on small wires, is clean to handle, saves labor and material and is economical.

Diamond "Rubber Crimps"

The Diamond Rubber Company, Akron, O., has announced a new product, known as "Rubber Crimps," or "U" Type Hydraulic

Packing, for service on hydraulic rams and presses. The new packing is made in rings of standard sizes, with a "U"-shaped cross section. The rubber is especially compounded to resist oil, completely eliminating this source of trouble. It is covered almost completely with a layer of fabric, which adds considerable strength, and helps to maintain the ¼-inch flare at the bottom. When there are worn or imperfect parts in the ram, the rubber packing with its flare works much more satisfactorily than any other kind.

This packing is said to have the following important advantages: Very low cost; suitable for use with pressures up to 3,000 pounds and more; not affected by the heat generated in a hydraulic press; wears very slowly and evenly; it fits snugly against the ram at all times, making an absolute seal, even when the ram is imperfect; thickness vertically through center is ¾ inch—twice that ordinarily used, which serves to stiffen the flare, and increase the strength and life of the packing; will not dry up when a press is idle; adapted for all sizes of rams, and can be furnished in any standard diameter.

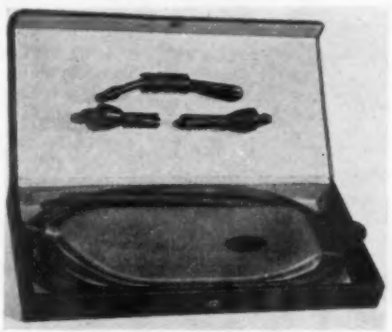
Arctic Parka

An elaboration on the Typhoon Suit made by the same firm, the Arctic Parka of the Chicago Rubber Clothing Company, Ra-

cine, Wis., is intended for those who prefer high rubber boots instead of the pants as furnished with a two-piece suit. The Parka is about 38 inches long and is made with a large shell pocket in front with flap fastened with glove fastener. Cuffs are made reducible by the use of a snap fastener. The garment itself is of fawn shade, in a fine quality weave outside material and close woven sheeting inside, with a coating of pure rubber between, joining the two fabrics together and making a combined material that is both windproof and waterproof. It is offered in small, medium and large sizes, and the company makes a similar garment with blanket lining known as the "Sideline Parka" for football players.

Anode Process Fountain Syringe

The Miller Rubber Company, Akron, O., has announced a compact, full-capacity fountain syringe manufactured by the anode process. This new anode product is designed expressly for travel, although it is convenient for home use where convenience



and sanitation are of importance and where toilet accessory storage space is limited.

It is practical and complete in every detail, yet has the delicacy of fine toilet accessories. Its design is revolutionary from a standpoint of practicability. The anode process gives the product transparency, combined with beauty and durability.

Gates Vulco Car Washer Hose

With car washing machines using pressures as high as 300 pounds, a sturdy hose is required to withstand the strenuous service to which it is subjected. To meet this strain Vulco car washer hose, manufactured by the Gates Rubber Company, Denver, Col., is made of extra heavy construction in three-braid molded type. It is the result of much experimental work devoted to the development of a high quality hose more than adequate to meet the demands of all makes of

car washer machines. Many garages use some kind of distillate in their solution to cut the traffic film and grease, but the tube of this hose is not affected by these preparations because of the special gas and oil resisting stock used in its construction. The cover is made of the same stock because oil on the floor will rapidly destroy covers not so protected.

Current Crude Rubber Items

TRADING LOWER IN 1931 ON RUBBER EXCHANGE

During the fiscal year ended August 31, 1931, rubber futures were traded on the Rubber Exchange of New York to the amount of 220,995 tons, as compared to 247,842½ tons in the year previous and to 470,330 tons in the year ended August 31, 1929. This was revealed in the annual report of the activities of the exchange submitted by J. L. Julian, president, under date of September 14.

"Rubber has not escaped the sharp declining tendency which has beset practically every world commodity," Mr. Julian says in his report. "This tendency has led to various suggestions to artificially control the production of rubber with a view of making for higher prices. Numerous efforts have been made to induce the British and Dutch governments to enter into a restrictive plan in connection with rubber production and export. Likewise, associations made up of plantation owners and producers of rubber have made efforts in the same direction. To date, however, there have been no tangible results along these lines and we still have, in respect to rubber, a free and open market with the immutable law of supply and demand fixing the price of the commodity.

"The almost constant decline in rubber prices the past year clearly reveals the unparalleled medium the Rubber Exchange offers in the matter of insurance through its hedging facilities."

ITALIAN CONSUMPTION IS FIGURED AT 14,000 TONS

At the end of July the larger Italian consumers were reported as well stocked with crude rubber which had been purchased at fairly low prices. However, buying continues at present cost levels. The small consumers are making their purchases on a "hand-to-mouth" basis.

Practically all crude rubber is bought on the London market, the largest user maintaining a London purchasing office. Italian rubber brokers do not materially enter into the picture, and control stocks that average inconsequently small.

It is estimated that in the first half of 1931 about 7,100 metric tons of crude rubber were actually consumed in Italy, and that unabsorbed stocks at the close of the six months period stood at around 5,500 tons.

The best available forecast places July-September consumption at 4,000 tons, and for the entire year 14,000 tons.

Exchange Differentials

The adjustment committee of the Rubber Exchange of New York on September 25 fixed the price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries against the new "A" contracts for the month of October as follows: No. 2 crepe (thick or thin) at 10 points; No. 2 ribbed smoked sheets at 9 points; No. 3 ribbed smoked sheets at 20 points; No. 4 ribbed smoked sheets at 30 points; No. 5 ribbed smoked sheets at 50 points; limit of allowance on No. 2 crepe at 25 points; allowance on rubber delivered in bales at 13 points.

Argentina Imports More Rubber

Operation of the new Goodyear and Firestone tire factories in Argentina has resulted in a sharp rise in crude rubber imports to that country. In the first half of 1931, imports totaled 1,630,096 kilograms, as compared to only 776,916 kilograms in the entire year of 1930. As recently as 1927, total annual imports into Argentina amounted to only 297,085 kilograms.

MALAYAN RUBBER EXPORTS LARGER IN SEPTEMBER

Gross shipments of crude rubber by Malaya, foremost producing country, amounted to 44,336 tons, during September, a cable to the Rubber Exchange of New York, Inc., reports.

This compares with 42,832 tons during August, and 49,229 tons during September, 1930.

Ceylon's exports also were larger, those to all countries totaling 4,195 tons, as compared with 3,756 tons during August, and 4,942 tons in September, last year. Of this quantity, 3,033 tons were sent to the United States last month as compared with 2,796 tons in August, and 4,942 tons in September, 1930.

British and Dutch Agreement On Export Tax Is Proposed

REHABILITATION of the rubber producing industry by means of an Anglo-Dutch export tax agreement has been proposed by A. G. Angier, chairman of the Bukit Mertajam Rubber Company, Ltd., and director of several other plantation companies. It is only after an interesting and very complete summary of the problems presented by the present condition of the rubber industry that Mr. Angier arrives at his decision to support the proposal for an export tax.

"If," he says, "consumption can not absorb production—past, present and prospective—how are the two to be bridged? It seems to me that it can be achieved only by an export tax, the proceeds or the effects of which would bring the two ends together." Mr. Angier admits that the proposal is not a new one and that, as a matter of fact, it has already been supported by various prominent people connected with the rubber industry or the rubber market.

Mr. Angier is firm in his belief that the co-operation of British and Dutch rubber growing interests and their respective governments is absolutely essential to the success of any such plan for the restoration of the industry. "Unless you get everybody to restrict, it is no good a few people doing it," he declares, "for in what you do to assist the market you have to carry the weight of the other man on your shoulders."

Tax Effective and Flexible

The tax is one that could rapidly be brought into execution, in Mr. Angier's opinion, and modified with equal speed if market conditions warrant. He summarizes the proposals for carrying out this idea of an export tax as follows:

1. Agreement between the British and Dutch governments to forthwith put an export tax—at a rate per pound to be agreed upon—on all rubber exported from their respective territories, or on goods manufactured wholly, or in part, of rubber.

2. Such export tax to be levied in cash, or by surrender of the requisite amount of rubber to equal cash calculated at the market price of rubber of the day. Surrender in kind might be in the form of latex, thus saving factory charges.

Would Restrict Further Planting

3. No additional land to be alienated for the growth of rubber; land already alienated only to be planted on terms to be arranged, but no rent to be collected on land on which rubber is not allowed to be planted (special precautions to be taken that no contraventions of this rule takes place and new native plantings made in remote districts).

4. The rate of tax in force from time to time to be of a sliding scale nature according to the selling price of rubber.

5. The selling price of rubber should be fixed at 6d. per pound for Standard R.S.S. (at that price manufacturers' interests should not be antagonized).

6. When that price plus the amount of export tax has been established for an agreed upon length of time control—that is the export tax—to cease. Export tax would be automatically resumed if market price went below 6d. per pound.

7. Proceeds of the tax whether in cash or kind would be at the disposal of the governments concerned. The cash would be used to purchase rubber locally, so as to avoid freight and charges, and the export duty.

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, OCTOBER 5, 1931

Crude Rubber

DURING the month of September the average of the daily closing prices for standard smoked ribbed sheets at New York was 5.08 cents a pound, a new all-time low for the commodity. This compares with the previous low of 5.38 cents in August and with the September, 1930, figure of 8.28 cents a pound. October quotations thus far have remained below the 5-cent level.

Prices quoted on the New York outside market at the close October 5 follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Oct.	.04⅝	@	.04⅝
Nov.-Dec.	.04⅝	@	.04¾
Jan. Mar.	—	@	.05
First Latex, crepe spot	—	@	.05⅛
Amber Crepe, No. 2	.04½	@	.04⅝
Amber Crepe, No. 3	—	@	.04½
Amber Crepe, No. 4	.04⅜	@	.04½
Brown Crepe, Clean thin	.04⅜	@	.04½
Brown Crepe, rolled	—	@	.04¼
Liquid Latex, per gal.	.70	@	.80
Paras—			
Up-river, fine	—	@	.06
Up-river, coarse	Nominal		
Acre Bolivian, fine	—	@	.06¼
Caucho Ball, Upper	.03	@	—
Centrals—			
Central scrap	.04	@	—
Esmeraldas	.04	@	—
Balata—			
Block, Ciudad	.18	@	.23

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-Oct.	—	@	2⅞d
Nov.-Dec.	2⅞	@	3d
Jan.-Mar.	3	@	3⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot	2⅜	@	2½d

Daily closing prices and sales on the Rubber Exchange of New York follow:

Reclaimed Rubber

Reclaimed rubber consumption in August, though low, continued to maintain its ratio to the amount of crude rubber used by manufacturers. The 410 tons of reclaim exported in August had an average value of 4.39 cents a pound as against an average value of July exports of 4.37 cents. Late prices follow:

High Tensile				
Super-Reclaim Black	lb.	.06	@	.06¼
High Tensile Red	lb.	.06¼	@	.06½
Shoe				
Unwashed	lb.	.05¼	@	.05½
Washed	lb.	.06½	@	.06¾
Tube				
No. 1 (Floating)	lb.	.07½	@	.08
No. 2 (Compounded)	lb.	.06	@	.06½
Tires				
Black	lb.	.04¾	@	.05¼
Black, selected tires	lb.	.05	@	.05¼
Dark Gray	lb.	.06	@	.06¼
Light Gray	lb.	.06¼	@	.06½
White	lb.	.07½	@	.07⅝
Truck, Heavy Gravity	lb.	.06	@	.06¼
Truck, Light Gravity	lb.	.06¼	@	.06½
Miscellaneous				
Mechanical blends	lb.	.03¾	@	.04¼

Scrap Rubber

The latest price quotations for the various grades of scrap rubber, continuing at the lowest levels in history, were as follows:

(Prices to Consumer)

Auto tire peelings	ton	19.00	@	21.00
Mixed auto	ton	8.00	@	9.50
Bicycle tires	ton	5.00	@	6.00
Clean solid truck tires	ton	22.00	@	23.50
Boots and shoes	cwt.	.87½	@	1.00
Arctics, untrimmed	cwt.	.40	@	.50
Inner tubes, No. 1	lb.	.03¼	@	.03⅝
Inner tubes, No. 2, compounded	lb.	.01⅞	@	.02
Inner Tubes, Red	lb.	.01½	@	.01⅝
Air Brake Hose	ton	9.00	@	10.00
Rubber Hose	ton	8.50	@	9.00

Cotton

DURING the month of September the average of the daily closing prices for spot middling upland cotton at New York was 6.525 cents a pound. This compares with an average of 7.21 cents during August and 10.85 cents during September, 1930. Thus far the month of October appears likely to set a new record low, with price quotations continuing well below the 6-cent level.

High, low and closing prices on the New York Cotton Exchange on October 5 were as follows:

	High	Low Oct. 5	Close	Close Sept. 19
Oct.	5.48	5.35	5.34	6.19
Dec.	5.63	5.49	5.51	6.40
Jan.	5.73	5.59	5.60	6.50

Tire Fabrics

The sharp depression in the market for raw cotton is keeping quotations for tire fabrics at record low levels. Current prices for the various grades are as follows:

(Prices Net at the Mill)

CORD				
Peeler, carded, 23/4/3	lb.	.25½	@	.26
Peeler, carded, 23/5/3	lb.	.24½	@	.25
Peeler, carded, 13/3/3	lb.	.22	@	.22½
Peeler, carded, 15/3/3	lb.	.22½	@	.23
Egyptian, carded, 23/5/3	lb.	.35	@	.36
Egyptian, combed, 23/5/3	lb.	.40	@	.40½
CHAFERS				
Carded, American, 8 oz.	lb.	.23	@	.23½
Carded, American, 10 oz.	lb.	.23	@	.23½
Carded, American, 12 oz.	lb.	.22½	@	.23
Carded, American, 14 oz.	lb.	.20½	@	.21
LENO BREAKER				
Carded, American, 8¼ oz.	lb.	.20	@	.25
Carded, American, 10¼ oz.	lb.	.20	@	.25
SQUARE WOVEN				
Carded, American, 17¼ oz. 23-11 ply	lb.	.24½	@	.25
Carded, American, 17¼ oz. 10-ply	lb.	.20½	@	.21

Sheetings

Sheetings remained more steady the past fortnight, apparently being near their bottom levels. The latest price quotations are as follows:

40-inch, 2.50-yard	yd.	—	@	.05¾
40-inch, 2.85-yard	yd.	.05⅛	@	.05⅝
40-inch, 3.15-yard	yd.	—	@	.06⅛
40-inch, 3.60-yard	yd.	—	@	.05¼
40-inch, 3.75-yard	yd.	—	@	.04⅛
40-inch, 4.25-yard	yd.	—	@	.03⅞

Ducks

Slightly stronger quotations prevailed for enameling ducks during the last two weeks. Prices quoted for these and other grades follow:

Belting and Hose	lb.	—	@	.21
Enameling	lb.	.20½	@	.21½
Single filling	lb.	.08½	@	.09
Double filling	lb.	.09½	@	.09¾

Closing Prices on Rubber Exchange of New York, Inc.

FROM SEPTEMBER 21 TO OCTOBER 5, 1931

		Spot.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sales
No. 1 Standard Contract of 10 Tons															
Sept.	21	4.95	4.85	4.85	4.85	4.91	4.97	5.04	5.09	5.15	5.23	5.31	5.41	——	152
	22	4.99	4.90	4.90	4.90	4.95	5.01	5.07	5.13	5.20	5.26	5.32	5.42	——	21
	23	5.10	5.02	5.06	5.10	5.15	5.20	5.25	5.32	5.40	5.48	5.57	5.67	——	103
	24	4.98	4.90	4.95	5.00	5.05	5.10	5.15	5.20	5.26	5.32	5.38	5.47	——	116
	25	4.73	4.65	4.69	4.74	4.79	4.84	4.89	4.96	5.03	5.08	5.13	5.23	——	109
	26	4.75	4.68	4.71	4.75	4.80	4.85	4.90	4.97	5.05	5.10	5.15	5.25	——	10
	28	4.70	4.65	4.67	4.70	4.75	4.81	4.85	4.93	5.00	5.05	5.10	5.20	——	20
	29	4.58	4.50	4.57	4.65	4.70	4.76	4.81	4.87	4.94	4.99	5.04	5.14	——	65
	30	4.56	4.50	4.57	4.64	4.69	4.74	4.79	4.85	4.92	4.98	5.05	5.15	——	40
Oct.	1	4.65	4.55	4.64	4.73	4.78	4.83	4.89	4.94	5.00	5.06	5.12	5.20	5.30	19
	2	4.60	4.53	4.60	4.67	4.73	4.79	4.85	4.91	4.98	5.02	5.07	5.17	5.27	39
	3	4.70	4.65	4.72	4.80	4.85	4.90	4.95	5.00	5.05	5.11	5.17	5.26	5.35	29
	5	4.59	4.57	4.61	4.66	4.72	4.78	4.83	4.89	4.95	5.01	5.08	5.15	5.22	48
Old "A" Contract of 2½ Tons*															
Sept.	21	——	4.70	4.70	4.80	4.89	4.95	5.02	5.07	5.13	5.21	5.29	5.39	——	8
	22	——	4.70	4.70	4.80	4.93	4.99	5.05	5.11	5.18	5.24	5.30	5.40	——	4
	23	——	4.90	4.90	5.00	5.13	5.18	5.23	5.30	5.38	5.46	5.55	5.65	——	—
	24	——	4.90	4.90	4.90	5.08	5.13	5.18	5.23	5.29	5.35	5.41	5.50	——	—
	25	——	4.50	4.50	4.60	4.79	4.84	4.89	4.96	5.03	5.08	5.13	5.23	——	5
	26	——	4.60	4.60	4.70	4.78	4.83	4.88	4.95	5.03	5.08	5.13	5.23	——	1
	28	——	4.50	4.50	4.60	4.73	4.79	4.83	4.91	4.98	5.03	5.08	5.18	——	10
	29	——	4.40	4.40	4.60	4.68	4.74	4.79	4.85	4.95	4.97	5.02	5.12	——	5
	30	——	4.50	4.50	4.60	4.67	4.72	4.77	4.83	4.90	4.96	5.05	5.13	——	1
Oct.	1	——	4.50	4.50	4.60	4.76	4.81	4.87	4.92	4.98	5.04	5.10	5.18	5.28	—
	2	——	4.50	4.50	4.60	4.71	4.77	4.83	4.89	4.96	5.00	5.05	5.15	5.25	4
	3	——	4.60	4.60	4.70	4.83	4.88	4.93	4.98	5.03	5.09	5.15	5.24	5.33	—
	5	——	4.50	4.50	4.60	4.70	4.76	4.81	4.87	4.93	4.99	5.06	5.13	5.20	—

*Quotations for months after December, 1931, are for New "A" Contract.

CHEMICALS

WHILE August rubber consumption was unusually low, it is still felt by suppliers of chemical materials to the industry that the four months from September to December will certainly show a rate of factory activity higher than that recorded in the same period last year. Sales of chemicals and compounding ingredients have held up fairly well and have enabled suppliers to keep their price structure steady, only carbon black suffering from extreme overproduction and consequent price cuts.

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.		
Aniline oil, drums, f.o.b. works	lb.	.14½@	.16
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	--
Oxynone	lb.	.68 @	.80
Phenex	lb.	.75 @	—
Pipsol	lb.	4.30 @	4.50
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.20 @	.22
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.07¾@	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Smith's 444 Crimson f.o.b. Springfield	lb.	.08¾@	.10
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Venetian red	lb.	.08 @	.06
Vermillion, quicksilver, English	lb.	1.75 @	1.80
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanium oxide	lb.	.21 @	—
Titanox B, f.o.b. St. Louis,	lb.	.06½@	.07
Titanox C, f.o.b. St. Louis,	lb.	.07 @	.07½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Horsehead Brand:			
Special	lb.	.07 @	.07½
XX Green	lb.	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅜@	.10⅞
blue label	lb.	.09⅜@	.09⅞
red label	lb.	.08 @	.08½
St. Joe, black label	lb.	.06½@	.07
red label	lb.	.06½@	.07
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.06½@	.07
Anaconda, selected lead free	lb.	.07 @	.07½
White seal	lb.	.11⅛@	.11⅞
Green seal	lb.	.10⅜@	.10⅞
Red seal	lb.	.09⅜@	.09⅞
Yellows			
Chrome	lb.	.16½@	.17
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	ton	56.50 @	57.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blacks			
Arrow "Aerofloted"	lb.	.03½@	.08½
Bone Black	lb.	.06 @	.12½
Carbon, compressed	lb.	.03 @	.07
Carbon, uncompressed	lb.	.03 @	.07
Disperso, f.o.b. Louisiana	lb.	.03½@	—
Disperso, f.o.b. Texas	lb.	.036 @	—
Drop Black	lb.	.06 @	.14
Fumonex	lb.	.03½@	.07½
Excello, compressed	lb.	.04 @	.08
Gastex, f.o.b. Texas	lb.	.03 @	.06
Lamp Black	lb.	.10 @	.40
Micronex	lb.	.03½@	.08½
Thermatomic-Thermax	lb.		
Flex	lb.		
P-33	lb.		
United carbon, fob Tex.	lb.	.03½@	.08½
Velvetex carbon	lb.	.03 @	.06
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	8.00 @	20.00
Colloidal	lb.	.05 @	.08
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Mineral Flour, c.l. f.o.b. mine	ton	20.00 @	23.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.25 @	.26
medium white	lb.	.22 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, white water grnd.	lb.	.06 @	.08
Off color (biotite)	lb.	.05 @	.07
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.57
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	— @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.19 @	.22

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Paradura	ton	62.50 @	65.00
Parmr, solid	ton	28.00 @	48.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.29½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.08¾@	.10½
Cottonseed, crule		— @	.04⅛
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.05 @	.06
Niger	lb.	.04 @	.04½
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.54 @	.61
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.11 @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb. bbl.		— @	4.22½
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	— @	.09¾
Alcohol, denatured, No. 1 bbls.	gal.	.28 @	.29
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulfide	lb.	.05½@	.06¼
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.30 @	.38
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.36¼@	.36½
wood	gal.	.38 @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	— @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refined, 125/127	lb.	.03⅝@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Aromatics—Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THAT imports of crude rubber into this country during the month of September once again exceeded the consumption of the commodity seems apparent, although official figures are not yet available. This means another rise in domestic stocks to a new all-time high level. The total of stocks on hand and afloat, in fact, is approaching to a point equal to a full year's consumption requirements at present levels of domestic factory activity.

British warehouse stocks, however, turned downward in the past month. The total on hand at London and Liverpool on September 26 was 134,834 long tons as compared to 137,184 long tons on August 29.

Reclaimed rubber consumption for August, like that of crude rubber, was the lowest since December, but the relative proportion used was higher.

Gasoline consumption in August equalled the high record established in July, indicating that the warm summer resulted in tires being used to the fullest extent. Automobile production, however, still lags behind.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,687	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	289,178,783	19.15	36,485	16,868,732	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.76	2,011	861,068	19.11	32,461
Oct.	38,168	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.93	3,154	1,085,432	15.37	39,538
June	39,993	12,215,848	13.79	3,174	1,028,653	14.47	36,819
July	35,182	10,553,944	13.39	2,807	759,260	12.08	32,375
Aug.	35,713	9,666,362	12.08	2,357	655,773	12.42	33,356
Sept.	35,380	8,460,812	10.68	1,514	430,772	12.70	33,866
Oct.	46,069	9,893,980	9.59	2,432	419,325	7.70	43,637
Nov.	29,401	5,700,086	8.66	1,300	271,348	9.32	28,101
Dec.	37,800	7,175,242	8.59	2,168	542,197	11.17	35,132
1931:							
Jan.	36,307	7,190,591	8.84	1,706	350,480	9.17	34,601
Feb.	34,005	6,564,969	8.62	1,799	357,078	8.86	32,206
Mar.	40,393	7,356,505	8.13	2,800	534,180	8.52	37,593
Apr.	44,536	7,712,941	7.73	2,607	528,947	9.06	41,929
May	35,526	5,886,638	7.40	2,501	418,301	7.47	33,025
June	46,233	6,918,900	6.68	2,749	440,604	7.15	43,484
July	43,469	6,023,748	6.19	1,435	223,587	6.96	42,034
Aug.	38,669	5,138,404	5.92	2,324	345,953	6.65	36,345
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1924	1925	1926	1927	1928	1929	1930	1931
Jan.	29,058	29,638	32,196	31,518	34,403	43,002	36,194	28,557
Feb.	25,736	29,761	31,136	30,137	33,702	41,594	32,302	28,797
Mar.	28,385	33,498	32,936	36,141	35,688	44,730	35,450	32,788
Apr.	27,129	34,139	32,696	35,871	32,772	47,521	39,686	33,321
May	25,845	35,822	29,364	34,592	37,333	49,233	39,386	37,817
June	22,753	35,822	28,598	33,801	37,676	43,227	34,195	37,916
July	23,396	36,053	27,577	29,219	37,407	41,526	29,508	31,937
Aug.	28,982	35,909	34,533	33,460	42,927	38,274	30,850	27,586
Sept.	31,497	31,691	32,904	27,214	39,882	34,707	25,515	.....
Oct.	31,520	29,047	29,836	26,790	40,857	34,800	27,516	.....
Nov.	27,289	28,253	28,080	26,792	37,461	27,659	23,691	.....
Dec.	27,199	28,748	26,293	25,492	31,232	28,531	21,687	.....
Totals	328,769	388,481	366,149	371,027	441,340	469,804	375,980	.....

Figures on Quarterly Basis

Quarter	1924	1925	1926	1927	1928	1929	1930	1931
Jan./Mar.	87,609	95,263	94,301	99,216	103,558	128,565	101,610	89,652
Apr./June	75,674	104,099	87,109	103,242	103,500	139,292	112,229	
July/Sept.	83,813	99,493	93,793	89,210	117,573	113,746	85,261	
Oct./Dec.	92,656	85,789	83,212	80,860	117,597	84,872	72,020	
Totals	339,752	384,644	358,415	372,528	442,227	466,475	371,120	

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1930	1931	MONTHS	1930	1931
January	25,731,000	26,844,000	July	38,256,000	39,459,000
February	26,509,000	26,133,000	August	37,433,000	39,459,000
March	31,029,000	31,037,000	September	37,823,000	
April	34,549,000	33,400,000	October	32,267,000	
May	36,497,000	35,716,000	November	30,984,000	
June	35,902,000	38,375,000	December	29,094,000	

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1929																																
June	21⅛	—	21⅛	21¼	21	21⅛	21⅛	21⅛	—	20⅝	20½	20½	20⅝	20¼	20⅛	20⅛	20¼	20⅜	20½	20¼	20¼	20¼	—	20⅝	20½	20⅜	20⅝	20⅝	20⅝	20⅝	—	20⅝
July	20⅝	21¼	21	21	21¼	21	21	22⅛	21⅜	20⅞	22	21⅜	21⅜	20⅞	20⅝	21½	21	21	20⅝	20⅞	20⅞	21¼	21¼	20⅞	21⅛	21¼	21¼	21¼	21¼	21¼	21¼	21¼
Aug.	21⅜	21	21	21	21	21	21	22½	21	20⅞	21	20⅞	20⅞	20⅞	20⅝	20⅝	20⅝	20⅝	19⅞	20⅝	20⅝	19⅞	20	20	20⅛	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜
Sept.	—	—	21	20¼	20⅛	20¼	20¼	21	—	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛
Oct.	19⅝	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜
Nov.	17⅝	17⅝	—	17½	—	17	17⅛	20⅜	20⅜	20⅜	—	16⅛	15⅝	20⅜	20⅜	20⅜	20⅜	16⅜	20	16⅜	16½	16⅛	16⅛	16⅛	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
Dec.	16¾	16¼	16¼	16¼	16¼	16¼	16¼	16⅜	—	16⅝	16⅝	16⅝	16⅝	16⅝	16⅝	16⅝	16¼	16	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞	15⅞
1930																																
January	16⅜	15⅝	15⅝	15⅝	15⅝	—	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
February	16¼	—	15	16	16¼	16¼	16½	16½	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼
March	15⅝	—	15¾	15¾	15¾	15¼	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾
April	15⅞	16½	16½	16¼	16¼	14⅝	14⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
May	14⅝	14⅜	13⅞	13⅞	—	13⅛	13⅛	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝
June	13¾	13⅜	13⅜	—	—	—	12	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝
July	12¼	12	—	10½	10½	10½	10¾	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜
August	10⅞	10⅝	9⅝	9⅝	9⅝	9⅝	9⅝	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜
September	9⅞	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝
October	7⅞	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼
November	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾
December	9½	9½	—	9½	9½	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼
1931																																
January	8⅝	8⅝	8⅝	—	8⅛	8⅛	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8¼	8¼	8¼	8¼	8¼	8¼	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8	8⅛
February	7⅞	7⅞	7⅞	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝
March	7⅝	—	8	8¼	8¼	8¼	8¼	8¼	8	8	8	—	—	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
April	6⅞	6⅞	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May	6	6	—	6⅛	6⅛	6¼	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜
June	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜
July	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜
August	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝
September	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛
October	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.80
1913	82.04	1917	72.28	1921	16.36

Average Monthly Price per Pound Since 1922

Month	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24	8.34
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85	7.70
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34	7.71
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.93	6.43
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24	6.49
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45	6.35
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24	6.37
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96	5.38
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	8.28	5.08
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	8.20	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	9.01	
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	9.05	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	11.98	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	July	Aug.	Sept.	Oct.	Day	July	Aug.	Sept.	Oct
1	3¼	—	2¼	2⅝	17	3⅛	2⅝	2⅝	—
2	3¼	—	2¼	2⅞	18	3⅛	2⅝	2⅝	—
3	3¼	—	2¼	2⅞	19	—	2⅝	2⅝	—
4	—	2⅝	2¼	—	20	3	2⅝	—	—
5	—	2⅝	2¼	—	21	3	2⅝	2⅝	—
6	3¼	2½	—	—	22	3	2⅝	2⅝	—
7	3¼	2½	2¼	—	23	3	—	2⅞	—
8	3¼	2½	2⅝	—	24	3	2⅝	3¼	—
9	3⅛	—	2⅝	—	25	3	2⅝	3⅛	—
10	3⅛	2⅝	2⅝	—	26	—	2⅝	2⅞	—
11	3⅛	2⅝	2½	—	27	2⅞	2¼	—	—
12	—	2⅝	2½	—	28	2⅞	2¼	2⅞	—
13	3⅛	2⅝	—	—	29	2⅝	2¼	2⅝	—
14	3⅛	2½	2⅝	—	30	2⅝	—	2⅝	—
15	3	2½	2¼	—	31	2⅝	2¼	—	—
16	3	—	2⅝	—					

Average Monthly Price Per Pound

Month	1929 Pence	1930 Pence	1931 Pence	Month	1929 Pence	1930 Pence	1931 Pence
Jan.	9.942	7.471	4.160	Aug.	10.505	4.880	2.385
Feb.	11.875	7.948	3.823	Sept.	10.160	4.075	2.524
Mar.	12.135	7.595	3.822	Oct.	9.620	4.023	
Apr.	10.490	7.391	3.082	Nov.	8.442	4.440	
May	10.717	6.926	3.035	Dec.	7.958	4.516	
June	10.580	6.195	3.082	Average for Year	10.291	5.926	
July	11.065	5.648	3.048				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.
1	6.95	5.80	11	6.75	——	21	6.20	——
2	6.85	5.70	12	6.65	——	22	6.25	——
3	6.80	5.60	13	——	——	23	6.55	——
4	6.70	——	14	6.60	——	24	6.35	——
5	——	——	15	6.60	——	25	6.30	——
6	——	——	16	6.60	——	26	6.30	——
7	——	——	17	6.55	——	27	——	——
8	6.75	——	18	6.60	——	28	6.10	——
9	6.90	——	19	6.60	——	29	6.00	——
10	6.70	——	20	——	——	30	5.95	——
						31	——	——

Average Monthly Price Per Pound

	1929 Cents	1930 Cents	1931 Cents		1929 Cents	1930 Cents	1931 Cents
Jan.	20.22	17.21	10.27	Aug.	18.62	12.03	7.21
Feb.	20.21	15.62	10.96	Sept.	18.83	10.85	6.52
Mar.	20.19	15.13	10.90	Oct.	18.46	10.63	
Apr.	20.29	16.39	10.19	Nov.	17.53	10.96	
May	19.41	16.43	9.38	Dec.	17.28	10.02	
June	18.74	14.48	9.05	Average for Year	19.03	13.57	
July	18.62	13.10	9.28				

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND			AFLOAT			ON HAND AND AFLOAT		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	76,342	131,744	209,487	93,330	61,863	56,187	169,672	193,607	265,674
Feb.	90,058	143,863	212,833	75,790	63,404	63,680	165,848	207,267	276,513
Mar.	100,536	141,843	217,804	67,066	63,646	63,133	167,601	205,489	280,937
Apr.	107,659	148,272	228,382	65,798	63,261	56,700	173,457	211,533	285,082
May	97,192	146,179	220,799	65,793	68,168	73,564	162,985	214,347	294,363
June	92,061	151,551	225,536	54,668	58,657	69,421	146,729	210,209	294,957
July	92,535	152,001	234,822	46,145	58,326	66,873	138,680	210,327	301,695
Aug.	90,769	158,604	240,816	49,423	61,168	61,469	140,192	219,772	302,285
Sept.	84,362	169,927	.....	58,758	60,923	.....	143,120	230,851	.....
Oct.	88,483	185,470	.....	59,180	51,122	.....	147,663	236,593	.....
Nov.	92,219	189,925	.....	62,358	52,538	.....	154,577	242,463	.....
Dec.	118,609	200,998	.....	62,388	56,035	.....	180,997	257,033	.....

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1929	1930	1931	At end of	1929	1930	1931
Jan.	25,191	60,434	81,093	July	30,080	81,048	81,317
Feb.	25,554	64,557	82,265	Aug.	35,605	80,931	
Mar.	28,214	68,923	84,736	Sept.	42,188	83,329	
Apr.	31,368	74,676	86,982	Oct.	47,803	77,647	
May	31,290	77,312	86,726	Nov.	52,454	76,887	
June	31,025	80,260	83,071	Dec.	54,304	78,013	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1931					
May	86,512	86,663	86,037	85,739	85,332
June	84,915	83,743	82,919	82,441	
July	82,170	82,079	81,766	81,104	
August	81,335	81,711	82,171	81,751	81,575
September	81,011	81,011	81,043	80,055	

Stocks in Liverpool

1931					
May	51,926	52,865	54,170	53,842	53,668
June	54,258	54,812	54,422	54,086	
July	54,522	54,444	54,697	54,335	
August	54,881	55,336	54,906	54,722	55,609
September	55,239	54,791	55,024	54,779	

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1929	1930	1931	End of	1929	1930	1931
Jan.	29,617	39,727	49,802	July	33,859	45,459	51,203
Feb.	32,373	44,371	49,283	Aug.	30,834	48,132	48,971
Mar.	29,437	45,657	49,590	Sept.	32,138	44,015	
Apr.	26,474	48,473	45,868	Oct.	33,770	39,930	
May	30,764	44,715	44,278	Nov.	30,963	41,674	
June	30,403	42,451	47,517	Dec.	35,548	45,963	

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Sept.	39,863	31,000	2,343	5,334	4,854
Oct.	38,587	27,630	2,378	5,600	5,156
Nov.	40,551	24,220	2,405	5,400	4,535
Dec.	40,919	25,980	2,569	5,189	5,122
1931:					
Jan.	41,620	24,500	3,168		5,124
Feb.	43,027	24,530	3,326		5,404
Mar.	40,227	25,800	3,622	3,857	4,843
Apr.	37,103	18,500	3,659		5,137
May	37,171	17,770	3,380		4,896
June	38,748	17,500	3,219	3,518	4,894
July	40,377	23,800	3,111		4,548
Aug.	40,606	23,700			4,671

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1926	24,199,524	78.8	1930	17,364,096	80.1
1931			1931		
January	681,301	67.9	July	812,642	74.0
February	1,010,774	73.9	August	924,236	80.8
March	1,425,336	81.4	September		
April	1,717,652	79.9	October		
May	1,508,349	83.7	November		
June	1,084,707	77.8	December		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1923	1924	1925	1926	1927	1928	1929	1930
Production	45,259	51,633	60,845	61,237	64,439	77,944	68,726	50,965
Shipments	45,204	50,120	59,262	59,002	64,059	74,296	69,395	53,638
Inventory[2]	5,772	7,427	8,142	10,456	10,264	13,624	11,838	9,003

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	6,301	4,485	3,675	6,211	4,406	3,744	12,855	11,924	8,957
Feb.	6,479	4,555	3,985	4,951	4,195	3,402	14,525	11,410	9,536
Mar.	7,049	4,863	4,663	6,289	4,717	4,122	15,329	12,513	10,014
Apr.	7,391	5,648	4,944	6,838	5,089	4,932	15,870	13,076	10,031
May	7,636	5,717	5,679	6,735	5,216	5,415	16,733	13,432	10,312
June	6,847	5,122	5,672	6,800	5,294	5,572	16,497	13,277	10,447
July	6,320	3,991	4,926	7,364	5,447	5,462	15,034	11,812	9,919
Aug.	5,693	4,166		7,354	5,175		13,337	10,848	
Sept.	4,460	3,365		5,623	4,405		12,070	9,812	
Oct.	4,611	3,582		4,649	3,499		12,042	9,803	
Nov.	3,378	2,654		3,355	2,834		12,127	9,595	
Dec.	3,057	2,814		3,237	3,361		11,838	9,003	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1923	1924	1925	1926	1927	1928	1929	1930
Production	60,116	70,706	82,614	76,618	70,823	80,180	68,829	52,420
Shipments	59,072	68,106	81,004	71,591	72,896	77,127	70,592	54,938
Inventory[2]	8,425	11,052	11,313	16,200	13,692	16,117	12,807	9,999

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	6,109	4,607	3,623	6,789	4,857	4,062	14,424	12,704	9,439
Feb.	6,346	4,634	3,916	4,948	4,337	3,400	15,936	13,036	9,921
Mar.	7,000	4,941	4,450	6,317	4,727	3,789	16,641	13,179	10,475
Apr.	7,157	5,510	4,617	6,716	4,848	4,636	17,000	13,784	10,413
May	7,181	5,535	5,413	6,598	5,074	5,281	17,745	13,852	10,549
June	6,542	4,950	5,358	6,515	5,265	5,397	17,294	13,612	10,504
July	5,793	3,939	4,955	7,605	5,855	5,831	15,311	11,657	9,589
Aug.	5,481	4,796		7,672	5,762		13,072	10,737	
Sept.	5,190	3,817		5,859	4,541		12,585	10,065	
Oct.	5,000	3,951		4,689	3,472		12,802	10,517	
Nov.	3,544	2,680		3,480	2,788		12,845	10,313	
Dec.	3,484	3,060		3,404	3,412		12,807	9,999	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			Grand Total
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	346,940	297,483	49,457	15,548	13,021	2,527	362,488
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,630	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.	224,368	187,288	35,758	9,792	6,946	2,846	234,160
Sept.	216,877	175,720	41,157	7,957	5,623	2,334	224,834
Oct.	150,044	112,800	37,244	4,541	3,206	1,335	154,585
Nov.	135,782	102,957	32,785	5,407	3,527	1,880	141,159
Dec.	155,701	124,173	31,528	5,622	4,225	1,397	161,323
Total	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931							
Jan.	171,848	138,317	33,531	6,496	4,552	1,944	178,344
Feb.	219,940	180,419	39,521	9,871	7,529	2,342	229,811
Mar.	276,405	231,244	45,161	12,993	10,483	2,510	289,398
Apr.	336,939	285,693	50,015	17,159	14,043	3,116	354,098
May	317,163	269,420	45,695	12,738	10,621	2,117	329,901
June	250,640	208,158	41,304	6,835	5,583	1,252	257,475
July	218,490	183,107	35,854	4,220	3,151	1,069	222,710
Aug.	187,197	155,425	31,772	4,544	3,426	1,118	191,741
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]						DUTCH EAST INDIES[5]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[2]	Sarawak[4]	British North Borneo[4]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1929:															
Aug.	50,441	15,469	34,972	6,079	685	993	641	431	4,644	7,298	10,782	1,032	1,563	499	69,613
Sept.	53,484	12,392	41,092	7,995	884	882	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,937	12,516	35,421	8,381	812	1,047	671	485	4,697	8,295	10,512	893	1,606	445	73,265
Nov.	46,279	11,204	35,075	6,660	1,065	668	672'	278	4,760	6,711	9,380	771	1,442	535	68,017
Dec.	46,147	15,018	31,129	8,683	900	930	672	320	5,189	8,279	11,102	966	1,674	443	70,287
1930:															
Jan.	52,585	11,773	40,762	7,741	1,560	791	642	386	5,709	7,831	8,928	856	1,837	585	77,628
Feb.	48,947	12,960	35,987	8,055	1,245	847	642	469	6,900	7,191	11,414	944	1,787	480	75,961
Mar.	47,320	12,236	34,084	6,617	1,129	976	642	391	5,796	6,612	11,214	643	1,674	536	70,314
Apr.	43,803	14,627	29,176	4,444	856	1,026	502	366	4,802	6,826	12,724	433	1,201	630	62,486
May	49,016	13,253	35,763	5,968	975	917	502	350	6,352	6,661	12,041	753	1,383	555	72,220
June	36,607	12,120	24,487	4,577	778	1,040	201	392	4,728	4,776	9,512	425	974	551	52,441
July	41,347	12,759	28,588	3,868	792	1,087	600	327	6,022	5,891	9,770	648	810	418	58,821
Aug.	47,802	10,304	37,498	7,077	600	740	600	335	5,892	7,197	9,520	394	809	382	71,134
Sept.	48,529	8,087	40,442	7,966	343	680	600	289	5,960	6,358	7,802	527	1,093	474	72,034
Oct.	47,770	7,312	40,458	7,681	591	598	650	300	5,916	6,956	6,352	667	669	449	71,287
Nov.	41,281	7,774	33,507	6,042	864	631	600*	311	5,334	6,401	8,001	654	658	238	63,241
Dec.	42,086	9,671	32,415	6,934	1,049	976	600*	335	6,254	7,196	8,476	721	1,365	353	66,674
1931:															
Jan.	41,579	11,029	30,550	7,039	1,315	770	542	424	5,923	7,348	10,328	1,218	994	295	66,746
Feb.	41,951	9,672	32,279	6,365	1,041	945	542	409	4,869	7,206	9,001	1,018	1,271	217	65,163
Mar.	48,589	12,009	36,580	5,881	1,209	930	542	536	5,434	7,104	11,258	1,233	1,338	430	72,477
Apr.	43,353	9,977	33,376	4,333	641	788	500*	340	6,473	6,063	8,759	327	629	333	62,562*
May	44,281	10,479	33,802	4,534	622	869	500*	413	7,372	6,799	10,955	702	1,110	306*	67,984*
June	39,505	12,115	27,390	5,246	1,086	1,138	500*	337	5,856	6,697	11,381	938	621	335*	61,525*
July	43,658	11,995	31,663	4,212	715	801	500*	316	6,671	7,510	10,711	841	1,565	335*	65,840*
Aug.	42,832	9,063	33,769	3,764		692	500*	210	6,397	7,044	8,641	983	856		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,399
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,436	2,493	2,643	172	—3,807	1,778	589	567	396,012
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,640	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,309	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,808
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	509,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,015
1929:															
Aug.	35,397	14,594	4,645	4,082	2,879	3,663	908	1,234	724	902	254	429	25	319	70,055
Sept.	32,912	17,010	3,889	4,691	1,908	3,511	1,224	1,235	853	672	253	361	91	477	68,453
Oct.	36,040	16,111	4,489	3,855	1,821	3,902	1,838	1,073	1,125	1,147	278	710	91	201	72,181
Nov.	41,097	13,141	3,082	3,776	2,709	3,221	1,275	1,226	1,453	361	253	595	62	313	72,564
Dec.	40,588	12,434	4,274	2,921	2,114	2,251	1,198	1,200	726	741	52	677	90	443	69,709
1930:															
Jan.	44,911	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	78,949
Feb.	40,792	10,293	4,482	3,697	2,250	1,386	1,385	2,705	457	1,143	188	315	200*	289	69,583
Mar.	42,216	12,846	4,354	4,289	3,776	2,663	1,083	1,153	975	678	358	322	200*	263	74,676
Apr.	43,036	13,058	5,006	4,488	2,303	2,769	2,067	929	673	1,431	158	461	200*	255	76,790
May	40,012	9,861	5,283	4,379	2,593	2,699	1,279	1,645	64	1,250	230	274	200*	282	65,629
June	37,374	9,645	4,458	3,794	2,579	2,677	1,378	1,574	67	691	343	507	200*	282	65,620
July	32,785	7,650	3,811	3,449	3,347	1,206	587	567	84	939	172	756	200*	342	55,395
Aug.	34,513	8,369	3,953	3,515	2,108	2,170	886	149	265	888	37	747	200*	450	58,250
Sept.	34,373	16,015	5,285	4,089	1,578	2,606	1,279	1,373	414	824	221	817	200*	411	69,486
Oct.	44,355	9,095	7,403	3,747	1,942	3,951	2,460	2,782	609	769	439	1,132	200*	351	79,264
Nov.	28,437	-250	13,662	3,074	2,128	4,008	2,510	2,140	464	596	364	1,180	200*	343	58,851
Dec.	35,202	12,249	7,149	3,105	1,347	4,104	2,815	544	950	814	205	647	200*	673	70,004
1931:															
Jan.	34,892	9,730	5,954	3,847	1,709	2,861	1,036	1,775	601	986	348	464	240	635	65,015
Feb.	32,575	12,226	4,510	3,374	1,927	3,264	1,393	1,022	495	785	157	475	201	366	62,770
Mar.	37,988	12,335	4,386	3,545	3,012	2,323	418	2,372	435	862	346	400	392	507	69,321
Apr.	43,036	9,440	4,346	3,054	2,070	3,478	528	1,450	457	515	333	495	208	324	69,734
May	33,343	7,212	2,880	3,231	2,748	3,755	1,023	1,034	884	1,153	86	495	180	711	58,735
June	44,190	5,636	4,002	3,504	2,112	2,988	1,462	3,279	1,112	1,058	272	577	207	607	71,006
July	44,052	5,366	3,301	3,226	2,592	3,083	809	3,141	627	1,507	41	429	145		
Aug.	36,709	5,030	3,393						283						

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics	Rubber Heels	Rubber Soles	Mechanical Goods Shipments
	Yards	Pairs	Pairs	Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1930	42,681,000	178,059,000	29,514,000	58,465,000
1930:				
July	2,940,000	15,117,000	2,663,000	4,910,000
August	3,458,000	13,735,000	1,473,000	4,552,000
September	5,046,000	14,322,000	2,193,000	4,083,000
October	5,209,000	16,460,000	3,056,000	4,186,000
November	2,822,000	11,083,000	1,426,000	3,400,000
December	1,909,000	13,101,000	3,021,000	3,338,000
1931:				
January	2,206,000	12,973,000	2,481,000	3,599,000
February	2,184,000	13,156,000	2,724,000	3,711,000
March	2,769,000	14,661,000	2,292,000	4,412,000
April	3,381,000	15,408,000	2,692,000	4,617,000
May	3,050,000	15,474,000	2,885,000	4,231,000
June	3,212,000	17,093,000	3,177,000	3,879,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Liquid Latex (1)	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	—	—
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	—	—
1921	58	26,945	814	1,077,859	1,745	351,893	—	—
1922	127	57,040	812	978,765	2,335	403,812	—	—
1923	1,155	542,227	700	898,524	4,565	853,308	—	—
1924	1,356	536,392	464	568,456	6,165	1,287,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,353	3,537,310
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1930:								
Sept.	100	28,000	45	39,512	486	86,664	402	127,751
Oct.	64	18,527	36	30,702	490	113,638	306	99,637
Nov.	—	—	73	61,650	389	84,219	332	65,265
Dec.	—	—	90	66,198	429	116,644	70	20,481
1931:								
Jan.	—	—	46	31,870	355	58,897	291	70,708
Feb.	—	—	17	13,801	511	114,100	369	89,470
Mar.	—	—	66	23,568	625	127,803	395	75,285
Apr.	—	—	219	69,284	676	140,309	372	73,867
May	—	—	120	44,025	205	36,086	318	82,202
June	—	—	245	79,786	681	123,616	706	129,496
July	—	—	67	20,777	331	64,493	583	104,868
Aug.	—	—	73	30,207	652	100,536	364	60,358

(1) Latex import figures not available before 1924.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

	Production	Consumption	% to Crude	Stocks*		Production	Consumption	% to Crude	Stocks*
Year		Tons			Year		Tons		
1921	36,725	41,851	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	146,808	155,673	39.6	24,008
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.	18,865	18,744	53.8	25,117
May	20,355	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,980	Dec.	13,429	11,531	49.0	27,464
1930:									
Jan.	15,910	17,454	47.6	24,241	July	12,322	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,243	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	11,433	10,480	41.4	21,996
Apr.	17,828	16,904	42.0	24,587	Oct.	12,349	10,724	39.3	21,145
May	17,812	17,052	42.7	23,356	Nov.	10,763	8,816	37.5	24,007
June	15,714	14,063	40.8	24,449	Dec.	10,073	8,449	39.3	24,008
1931:									
Jan.	10,349	10,728	37.6	22,429	July	11,393	11,447	35.8	17,720
Feb.	10,871	10,800	37.5	18,878	Aug.	10,110	9,972	36.2	17,165
Mar.	12,938	12,524	38.3	18,375	Sept.	.....	.....	.....	.....
Apr.	13,267	11,745	35.0	18,356	Oct.	.....	.....	.....	.....
May	13,478	13,103	34.6	18,088	Nov.	.....	.....	.....	.....
June	14,066	13,045	34.4	18,505	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.
(Rubber Manufacturers' Association figures raised to 100%)

REVIEW DESK

Books, New Publications, Catalogues, Etc.

RECLAIMED RUBBER. By A. T. McPherson. Published by the Bureau of Standards, United States Department of Commerce, Washington, D. C. 1931. 24 pp. $0.10.

The need for some form of text book covering the reclaimed rubber industry has long been felt. That need is not completely met by the present volume; but the author, who is chief of the Rubber Section of the Bureau of Standards, has at least prepared a careful review of the principles of reclaiming operations and of the properties and uses of reclaim. Intended primarily to be of general interest and to answer the numerous questions asked of the Bureau in regard to reclaim, this handbook nevertheless contains much technical detail with respect to processes for reclaiming and the characteristics of the product, such as tensile strength, elongation, abrasion resistance and aging. The author rightly discourages individuals who wish to undertake the reclaiming of rubber on a small scale, pointing out the necessity for special equipment and skilled technical control. He concludes with a bibliography of technical magazine articles.

RUBBER AND RAILWAYS. By Colin Macbeth. Published by the Rubber Growers' Association, Inc., 2 Idol Lane, Eastcheap, London, E. C. 3, England. 1931. 68 pp. For free distribution.

Railroad engineers in constantly striving after greater traveling comfort and more efficient operation have already found wide use for rubber products, and Mr. Macbeth is hopeful that the amount of rubber employed may be extended. The commercial possibilities in this field may be estimated from the fact that some British passenger coaches use over 600 pounds of manufactured rubber while a locomotive and tender unit sometimes makes use of nearly 150 pounds. Mr. Macbeth devotes separate chapters to rubber on British, American and French railroads and finds that his native country has gone far ahead of the other two nations in the successful adoption of rubber for railroading. A more detailed account of his findings will be noted on Page 25 of this issue. The author has, however, omitted mention of the use of rubber absorption pads by the Canadian Pacific, the development of the Goodyear rubber-cushioned wheel tested this year on the Akron, Canton & Youngstown Railway, and the use of rubber belts between car wheels and lighting system dynamos. The Avery elastic rubber spring is a development of recent months that also holds much promise for the future.

TESTING APPARATUS FOR RUBBER AND INSULATING MATERIALS. Published by Louis Schopper, Bayrische Strasse 77, Leipzig 3, Germany. 1931. 48 pp. For free distribution.

Mechanical tests for rubber and rubber products have more than justified their place in the industry, and instruments for such tests have in recent years reached a degree of accuracy that once would have been thought impossible. The equipment of this leading German firm is attractively illustrated and thoroughly described in this catalog. These machines and this catalog are distributed in the United States by Testing Machines, Inc., 314 Broadway, New York City.

LIST OF MEMBERS. Published by the Institution of the Rubber Industry, Faraday House, 10 Charing Cross Road, London W. C. 2, England. 1931. 50 pp. For distribution to members.

That the Institution of the Rubber Industry has been able to increase its membership to 1,374 as of last month compared with 1,266 in September, 1930, is an indication of the regard in which its service is held by the British industry. The present roster shows the addition of Messrs. Boggs and Winkelmann to Fellowship in the Institution last year, an honor previously held only by Messrs. Bierer, Dinsmore, Geer, Somerville, Spence and Wiegand in the United States.

FUNCTIONS OF AN ASSISTANT TO THE PRESIDENT. Published by the Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. 1931. 16 pp. For free distribution.

The position of Assistant to the President is becoming increasingly popular in rubber company organizations, and this report should, therefore, find interested readers in the industry. It is the thirteenth in a series of studies on business organization.

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The RUBBER AGE

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Published Twice-a-Month by

The PALMERTON PUBLISHING CO., Inc.

(Publication Office—1-3 Peace Street, New Brunswick, N. J.)

Editorial Office: 250 West 57th Street, New York City

Entered as Second Class Matter, August 24, 1927, at the Post Office at New Brunswick, N. J., under Act of March 3, 1879.

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THE RUBBER AGE is indexed in *Industrial Arts Index*

Carbon Black

CARBON black stocks are now at their highest peak and the selling price at the lowest level in the history of the industry. New legislation in Texas may, however, have a decided effect on both production and prices in the future. A survey of the carbon black situation and authoritative statements from leading executives of the producing companies, commenting on the prospects for the near future, have been made the subject of a feature article in this issue of THE RUBBER AGE.